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FRIEDRICH AUGUST FLÜCKIGER.

By Fr. Hoffmann.

As the scope of each of the auxiliary sciences of pharmacy has constantly expanded, the faculties and the life of an individual man are no longer sufficient to grasp the whole domain, or even the ramifications of either of such sciences as chemistry, physics and botany. Division of labor in every direction, therefore, has more and more taken place in the study and pursuit of these sciences. The *universalist*, possible a generation ago, has largely been reduced to the *specialist* among the professors and students of our days. The master minds in pharmacy, conversant with the theory and practice of the various branches of the pertinent sciences, and acting with equal proficiency in more than one, as teachers, investigators and authors, therefore, are also passing away, and are replaced by the specialist. One of the few of these generic stars in the domain of the sciences pertaining to pharmacy of the departing century was Professor Flückiger, who passed away at his home in Switzerland, on December 11, 1894.

Friedrich August Flückiger was born on May 15, 1828, at the village of Langenthal, near Bern, Switzerland. His father was a small merchant, and the boy was educated at the village school, with a view to pursuing a mercantile trade. At the age of seventeen years he entered a commercial institute in Berlin, but his inclination towards the natural sciences seems to have been nursed and to have found encouragement in Berlin, for he soon relinquished the course of the commercial college in order to attend lectures in chemistry, geology and botany at the University of Berlin. In 1847, he entered

a pharmacy in Solothurn, Switzerland, as an apprentice. This introduction into the practice of pharmacy seems to have lasted but three years, for during the two years of 1850 and 1851 Flückiger served as a drug clerk in Geneva and in Strassburg. In the fall of 1851, he entered the University of Heidelberg, where he obtained the degree of Ph.D. in 1852. He worked there in the laboratory of Professor Delffs, and subsequently, for a short time, with Professor Wurtz in Paris. Dr. Flückiger then spent some time in London, where he made acquaintances that were, later on, of much value to him; among them was Daniel Hanbury. He returned to Switzerland, and, in 1853, entered into partnership for the purchase of a pharmacy in the small town of Burgdorf, near Bern. He remained there for seven years, occupying his abundant spare time largely with linguistic, historical and scientific studies, and also with an active participation in the elaboration of the first edition of the Swiss Pharmacopœia, published in 1865.

Although Dr. Flückiger had published but few essays, his talents and comprehensive knowledge were soon recognized, and in 1857 the Pharmaceutical Association of Switzerland elected him its chairman, which position he retained, with great benefit to the society, for nine consecutive years. In 1860, Dr. Flückiger was appointed director of the state pharmacy (Canton-Apotheke) at Bern. He gave up his pharmacy and residence in Burgdorf to accept the position; he filled it, and soon, also, that of co-examiner of pharmacists and that of state chemist until 1873. Besides, in 1861, he established himself as lecturer in pharmacy and pharmacognosy at the University of Bern, and in 1870 was appointed to full professorship. His position at Bern in the laboratories of the Canton Pharmacy, as well as in that of the University, afforded Professor Flückiger excellent chances and ample inducements for application and research in the domain of practical pharmacy. He made good use of these opportunities, and with the wealth of his knowledge, the thoroughness in all his work, and with much zeal and assiduity, accomplished during the years of his stay in Bern a large amount of important practical and literary work, including the revision and the editing of the second edition of the Swiss Pharmacopœia in 1872, and the elaboration of the first editions of his two greatest works—the "Manual of Pharmacognosy," published in 1867, and "Pharmacographia," published in 1874.

The most significant and honorable recognition of Professor Flückiger's labors consisted in his call by the German Government as Professor of Pharmacy and Pharmacognosy and Director of the Pharmaceutical Institute, established at the reorganization of the old German University of Strassburg in Alsace in 1873. Professor Flückiger accepted this call, and filled the position entrusted to him with success, and with much credit to himself and the University, for nineteen years. In 1892, he retired at the age of sixty-four years and settled at his old home among the snow-clad Alpine ranges at Bern, with the intention of applying his remaining years to literary work, and particularly to collecting and assorting the accumulated material in preparation for the elaboration of a comprehensive history of medicinal plant drugs.

The years in Strassburg were the most prolific, as well as the most useful ones, in Professor Flückiger's indefatigable activity as teacher, investigator and author, and he looked upon them as the most happy ones of his long and successful career. There he enjoyed the attractive and inciting intellectual intercourse with the *élite* of the pharmaceutical students of Germany and of foreign countries, who were drawn thither by the reputation of the great scholar, and who received his instruction in the lecture-room and the laboratory, passed the searching ordeal of his examination, and finally returned home, imbued with a love for knowledge and study for its own sake, and with appreciation of their great teacher and veneration for him.

Upon the retirement of Professor Flückiger from his many years of academic activity, the veteran scholar was the recipient of many honors. The Emperor of Germany honored him by a decoration, the scientists of many countries presented him through a special committee with a magnificent album containing more than 300 photographic portraits, and with a handsome donation as a contribution to the erection of a comfortable home in Bern. Moreover, a committee was formed for the institution of a Flückiger Memorial Fund. The proceeds collected were to remain in the control of this committee, consisting, at the time, of Professors Tschirch of Bern, Schaer of Strassburg, Hilger of Munich, F. Weber of Zürich, and Professor Flückiger. Upon the death of the latter, his place in the committee has to be filled by a person elected by the National Association of Pharmacists of Germany. The object of this memo-

rial fund is the establishment of one or more endowments for talented students in pharmacognosy, and of a Flückiger Medal to be presented at special occasions to distinguished investigators and scholars in the domain of pharmaceutical and kindred sciences and arts. In the course of three years this medal has been conferred upon eighteen gentlemen.[1]

At the time when Professor Flückiger entered pharmacy, the domain of chemistry, as well as of botany, could be fairly well mastered by an intellect so richly endowed with the power of ready comprehension and with an unusual memory. A prodigious amount of solid knowledge in all departments of literature relating to pharmaceutical and kindred sciences, and close application, enabled him to keep abreast with the prolific and large accumulation of new facts, resulting from the progress of chemical and botanical knowledge. He early became interested in plant drugs, and his bent towards an historical aspect in all knowledge gradually led his interest and study pre-eminently in this direction. Otto Berg had inaugurated principles and methods of stricter discrimination in the

[1] As the list of the recipients of the Flückiger Medal has been frequently reported incorrectly, the names may here be mentioned as they were recently published by the committee in Bern: John Attfield of London; H. Beckurts of Braunschweig; Born of Buenos Ayres; G. Dragendorff of Dorpat; H. T. Fritzsche of Leipzig; P. Giacosa of Turin; Thom. Hanbury of La Mortola; A. Hilger of Munich; Fr. Hoffmann of New York; Th. Husemann of Göttingen; J. B. Nagelvoort of Detroit; Nyegaard of Christiania; Theod. Peckolt of Rio de Janeiro; Pfersdorff of Strassburg; G. Planchon of Paris; E. Schaer of Strassburg; Alex. Tschirch of Bern; A. Vogl of Vienna.

study and knowledge of plant drugs, and, especially by his text-book of pharmacognosy (1852), and by his master-work, "Atlas of Pharmacognosy" (1865), had laid an exacter scientific foundation for modern pharmacognosy. Upon this basis, Flückiger continued and improved the new structure of this branch of applied science. Fifteen years after the first appearance of Berg's text-book he published one in 1867, and in 1875, jointly with Daniel Hanbury, enriched English literature for the first time by a standard work on pharmacognosy, namely by the "Pharmacographia." These two works, the former republished twice, the latter once, were his chief literary achievements and will remain his most lasting literary monuments. Both works, apart from their comprehensive and thorough treatment of the subject matter, are remarkable for the introduction of a large amount of historical material and data. He recognized the superior value of historical research and cultivated it with all his inquisitive and critical powers. Flückiger became the historian of pharmacognosy and his early demise is the more deeply to be regretted and is the greater a loss to the world of science, as he had in the course of his life accumulated an immense amount of historical material and data, preparatory to his long cherished desire to devote the leisure of his ripe and declining years to the consummation of his life work, namely the writing of a comprehensive history of plant drugs.

The same bent towards the historical aspect in all knowledge lends equal value and charm to his third great literary work, the Text-book of Pharmaceutical Chemistry, published in one volume in 1879, and republished in a largely extended second edition in two volumes in 1888.

Besides these main works Professor Flückiger has published two more concise text-books for the study of pharmacognosy (Grundniss der Pharmacognosie, 1884, second edition, 1894, and Grundlagen der Pharmaceutischen Waarenkunde, 1873, second edition, 1885), and a chemical work on the application of chemical analysis to organic chemical compounds (Reactions).

The number of his miscellaneous writings published in the course of many years is great; they embrace biographical, historical and educational essays, sketches of the culture of plants useful in the industries and arts, and reports on original investigations in the domain of chemistry, pharmacy, pharmacognosy and botany, insti-

tuted by himself or jointly with advanced students during his 30 years of academic activity as professor and director of University laboratories in Bern and Strassburg. Most of Flückiger's writings, and especially the miscellaneous essays, are distinguished by his mastery of a concise style and logical diction, and by the wealth and the depth of his philosophical and historical conception, and therefore are as attractive as they are instructive. Some of his essays may, on account of the beauty and grace of their style and conception, well be ranked among the few classic productions in modern pharmaceutical literature.

As a teacher Professor Flückiger was esteemed on account of his conscientious and painstaking consideration of every detail in the instruction, both on the platform and in the laboratory; he was not so much a fluent as an impressive lecturer. His reputation drew pharmaceutical students from various countries to the University of Strassburg, and not a few of the most eminent pharmaceutical scholars of the younger generation at home and abroad have received his instruction, and by his inspiration have been imbued with a taste for knowledge and research for their own intrinsic interest and value, and for thoroughness in all study. They cling with veneration to the memory of their departed teacher and master.

Professor Flückiger's health had been failing for about one year. Early last year he accepted a long-standing invitation of friends to visit our country, at the same time hoping that the sea voyage during the summer months would prove beneficial to his health. He furthermore expected to search some of our larger public and private libraries for historical material in reference to American drugs, in addition to the accumulated material for his contemplated historical work. After a pleasant voyage from Genoa, he arrived here on the 28th of May, stopping most of the time of his stay in America in Brooklyn, paying brief visits to Washington, Baltimore, Philadelphia and Boston, making a trip to Niagara and resting for a few weeks at a summer resort in the Shawangunk Mountains, N. Y., and at Cape Cod, Mass. At the end of August Prof. Flückiger attended the annual meeting of the American Association for the Advancement of Science, in Brooklyn, and made there the personal acquaintance of many American scholars long and well known to him. He returned to Europe on September 15th, and after a delightful sail to

Genoa, stopped, on his way to Bern, for a few days at La Mortola. Soon after his return to Bern, early in October, a complication of diseases of the alimentary canal set in, and, after an illness of nearly six weeks, he fell asleep at 11 o'clock on the 11th day of December, 1894.

"Sustained and soothed
By an unfaltering trust, he approached his grave
Like one who wraps the drapery of his couch
About him, and lies down to pleasant dreams."

The following is a list of Prof. Flückiger's principal works:

1862. Contributions to the History of Pharmacy in Bern.
1867. *Manual of Pharmacognosy*, second edition, 1883, third edition, 1891.
1873. Frankfort list of drugs. Contribution to the mediæval history of pharmacy.
1873. *Elements of Pharmacognosy.* Introduction into its study. Second edition jointly with Dr. Alex. Tschirch, 1878.
1874. *Pharmacographia* (jointly with Dan. Hanbury), second edition, 1879.
1876. Contributions to the History of Pharmacy.
1879. *Manual of Pharmaceutical Chemistry.* Second edition, 1888.
1883. *The Cinchona Barks.*
1884. *Elements of Pharmacognosy.* Second edition, 1894.
1884. The Industry of Essential Oils in Grasse.
1885. Historical Sketch of the Pharmaceutical Institute at Strassburg.
1885. Pharmaceutical Education in Germany.
1886. Contributions to the History of Pharmacy in Italy.
1888. Contributions to the History of Pharmacy in England.
1889. Easter Vacation in Italy.
1892. *Reactions.*
1893. Further Contribution to the History of Pharmacy in Bern.
1893. British Work and Progress in India.
1893. The Industry of Essential Oils and Synthetic Aromatas.

Prof. Flückiger's last contribution to a journal was his description of the Blasckka collection of glass models of plants in the Agassiz Museum in Cambridge, written for the September issue, 1894, of the *Pharmaceutische Rundschau*.

The name *argon* has been given to the new element stated to exist in the atmosphere, and, at a special meeting of the Royal Society on January 31st, Lord Rayleigh and Professor Ramsay are to present their paper on the supposed new constituent, and the matter will then be discussed.—*Phar. Jour. Trans.*

THE CULTIVATION OF LICORICE ROOT IN THE UNITED STATES.

By Henry N. Rittenhouse.

Many interesting accounts of the cultivation of the licorice plant are to be found scattered through the works on materia medica, agriculture and gardening during the past one hundred years, and the methods therein described are essentially the same as those pursued at the present time, and which it is not the intention to reproduce here.

Licorice root is cultivated, in the true sense of that word, in so few places in the world, and to so small an extent as an article of commerce, as hardly to be worth mentioning. One or two places in England, and a like number in France and Germany, embrace all the localities I happen to be acquainted with, and the area of land under cultivation varies from a few rods to an acre or two, five acres being an exceptionally large field.

The large amount of licorice imported into this country, and which also supplies the needs of the world, grows wild, without any care or cultivation whatever. Italy and Spain supply a small percentage of the total amount, probably 5 to 8 per cent., while Southern Russia, along the line of the Transcaucasian Railway, supplies two-thirds of the remainder, and Asia Minor and Syria the other one-third. The total amount of all kinds imported into the United States is about 80,000,000 pounds per annum, on an average. In 1872, the imports were about 5,000,000 pounds, and the consumption still increases yearly.

The licorice plant grows over an area, extending from the shores of the Mediterranean, on the south (latitude 30°), to Siberia, on the north (latitude 55°), and from the western shores of Europe to the plains of Persia and farther India, and from low levels to 1,500 feet above the sea; thus showing over what an immense area of land and variety of soil and climate it will grow vigorously. In Afghanistan it forms the principal fuel. It is a hardy and tenacious plant, almost impossible to eradicate where it once obtains a foothold, and growing without care or cultivation when once fairly started. The mention of these conditions under which the plant, which furnishes the root of commerce, is found, is to illustrate its hardy nature.

As the plant grows wild, and generally on wild and uncultivated land, and is dug and prepared for market by cheap Asiatic and

Russian labor at starvation wages, the first question naturally is, would it pay to grow it in the United States? The answer to this is: if it is intended to grow it as root dried and sold in competition with this wild, imported root, probably not; but to propose and advance such an enterprise is not my object.

Licorice root, as found in commerce, is dried and pressed in bales. The root, when freshly dug, contains, on an average, 50 to 60 per cent. of moisture. This must first be dried out, which is done by exposure to the air, much as hay is made, requiring frequent turnings and handling to prevent, as much as possible, heating, fermenting and darkening during the drying, as well as the wetting by rain or snow, which may be frequent before the root is dry enough to press for shipment. The root, when nearly dry, and danger from further damage from the presence of moisture has passed, is piled up in large stacks until ready to be pressed. Around these stacks are dug ditches for draining the ground, and after a heavy shower, or prolonged period of rain or snow, these ditches will fill with a black water, containing a very strong taste and a high percentage of the extractive matter of the root; this, of course, deteriorates its value and is itself waste. When dry enough, it is pressed in powerful hydraulic presses worked by steam, so as to reduce the bulk to a minimum, and so save freight in shipment. The bales are bound with iron straps, and sometimes covered with canvas.

The plants, which supply the root as found in commerce, have been growing for a long time, some pieces being two to three inches in diameter when dry, indicating probably a growth of twenty or more years; but these very thick pieces are usually rejected as being worthless for making extract, as a root after four years' growth begins to deteriorate in value for the purpose of making extract, because of becoming too woody and fibrous, and lessening the percentage of extractive matter. On the other hand, the very thin fibres of one year or less growth are equally worthless, yet the the shipper works in as much of both kinds in the bales as he dare, to say nothing of adhering soil and debris. Root of three years is the most desirable, if it could be obtained, as being the richest in extractive matter.

It will be seen from the above that the preparation of licorice root for market, as we find it, is a tedious and expensive process —first, the organization of the business, in the employment of clerks,

superintendents and a host of minor officials to superintend the diggers, receive and weigh the root at the various stations appointed in different localities, pressing, shipping, etc. The right to dig over a certain territory is obtained by lease or tithe, as the land is owned by the Government, the church, the village, or by individuals. Then there are the digging, drying, curing, pressing and baling, inland transportation, ocean freights, insurance, fire and marine, bankers' and brokers' commissions, interest and loss of weight in transportation. These expenses alone, throwing aside the cost of the freshly dug root, will represent fully 75 per cent. of the price of the root ex-ship in the United States. The foregoing expenses are fixed and unavoidable, as the fresh root could not be transported, owing to its perishable nature. These considerations have led me during the past four years to investigate the feasibility of growing this plant in the United States.

The consumption of the extract in this country is now so large and important, especially in the manufacture of chewing tobacco, that in case of a European war, a blockade of the Black Sea at the Dardanelles, or the Mediterranean at Gibraltar, would effectually cork up the world's supply, and throw the large American industry of tobacco-manufacturing into confusion. As licorice has become a more or less important ingredient in most brands of chewing tobacco, and the present generation of chewers has become so accustomed to its use, new brands omitting this ingredient might be unsalable.

Referring now to the vast and varied area over which the licorice plant grows wild, and the great variety of soil and climate in the United States, as well as cheapness of land and labor, and the ability to obtain large tracts of land of comparatively easy accessibility for transportation and labor, has led me to present the following information on the subject, of what I believe can be made a new and profitable industry in this country, with money and time intelligently expended. I believe it would, in time, pay better than either sugar cane, sugar beets, rice or cotton, although the industry would not be as large or important as any of those, which are all exotic, the cultivation of all of them having been begun in a very small way in the United States.

Licorice extract can be made as well, or better, from fresh root than from the dry, and is so made in the countries that furnish the

root; but the duty on it of five cents per pound restricts largely its importation, while the root is free.

The thought I have in mind, in introducing the growing of licorice here, is very much on the same lines as sugar is now made from cane and beets; that is, to have large tracts of land devoted exclusively to the growth of the plant, with the factory for making the extract from the fresh root in, or near, the fields. The present sugar factory, too, could easily be adapted to the manufacture of the licorice extract, the apparatus required being simply suitable crushers or shredding machinery, the diffusion battery and vacuum pans for evaporating. Sugar factories, too, could be utilized when not running on sugar, as the proper time for digging the root is from October to April, and if the root is not needed one year, it can be left in the ground until the next, not only without deterioration, but to its increased value in weight. It is not well, however, to allow the root to exceed five years in growth; three or four year root is the richest in extractive matter; as it becomes older it becomes more fibrous. Frost or drought do not injure the root when once well established; young and tender plants in the first year might be injured. The elaborate and expensive methods of culture, followed by the gardeners of Europe, would be entirely unnecessary here on a large scale. After selecting a suitable tract of land, having the necessary requirements of soil, location, etc. (prairie land, because it is open and easily tilled, would be my choice), it need only be plowed once to turn down the grass and weeds, harrowed, then laid out in furrows about 25 to 30 inches apart, and the buds or cuttings, set in the rows 6 or 8 inches apart, and covered by a plow, throwing a furrow over the buds from each side, or even cover them 3 or 4 inches with a hoe; this is all. From time to time, during the growing season, a cultivator should be run between the rows to keep down weeds or grass. The tops, at the end of the growing season, should be cut off; this could be done with the mowing machine. The second and third year the treatment would be the same. In the fall of the third year the crop would be ready to harvest. The cost of harvesting would be the most expensive part of the business, and thus far I am unable to give any exact figures, but up to the point of harvesting, the cost of planting and cultivation would not exceed $4 per acre per annum, or $12 for the three years, including interest and taxes. As the root grows to a great depth in a light soil, if digging had to be

resorted to, the expense would be more, and some other mechanical means would have to be used, as a plow or digger. All the world over, digging by shovel and pick is the usual method; one reason for this is because labor is very cheap, and another is, the plants grow in patches often widely apart, and individual plants, so scattered over such an extensive area that no other plan is possible, while in the field, as proposed, the plants would be in rows and an acre very thickly grown.

An acre, with the rows 30 inches apart and the plants in the rows 6 to 8 inches apart, would contain 20,000 plants, and narrower rows and closer planting is permissible, so that many more than 20,000 plants can be grown to the acre. I prefer to take 20,000 plants per acre as a unit for calculation, to allow for loss in many ways of a liberal percentage, say one-third, by failure to grow and by dying after starting, etc. The growth each year is not so much in weight as one might be led to think by reading what has been written on this subject; but so far as I have been able to ascertain, there is nothing at all definite and specific published. The information herein is of my own investigation and experiment, and is only offered as approximate, as indeed the whole subject must be considered as still in an experimental stage, but, in my opinion, full of promise if properly entered upon with a view to making it a commercial success.

By obtaining plants from the growers of one, two, three and four years' growth drying and weighing them, I get the following results: plants of three years' growth will average when dried four ounces, equal to eight ounces fresh; or to an acre of 20,000 plants 10,000 pounds as the crop at the end of the third year, costing, according to my estimates for growing and harvesting, $15 for the crop of 10,000 pounds of fresh root, at the end of the period of three years.

I have not given the weights of the other root, as three year root is the basis on which I am working; four year growths would show much larger results, and younger roots are too immature to dig.

Allowing a loss in various ways of one-third the plant, leaving 13,300 yielding ½ pound each of fresh root, or 6,650 pounds at the end of the third year at a cost of $15, or even $20, and the enterprise would be profitable. The 6,650 pounds of fresh root represents one and a half tons dry, and the lowest price at which dry Russian Root, or Asiatic, can be laid down in the United

States, is about £8 per ton; the crop of a ton and a half would be worth $60, costing $20, or a net profit of $40 per acre for the three years, equal to $13 per acre per annum as the profit of growing the root; but if the fresh root is at once made into extract, as I propose, the profit would be much greater even at 4 cents per pound, just half the present price of the extract.

My own experience in growing the plant in the United States has thus far been very moderate in results, owing to causes that might have been prevented, viz.: inundations, unsuitable buds for planting, and possibly a want of care or interest, or experience, on the part of those in charge, to say nothing of the effect of unusually hot and dry weather on the young plants before they had become acclimated. I have grown the plants in several places in New Jersey, Pennsylvania, Louisiana and Florida, and still have some growing in the different localities, and believe it to be quite a feasible matter to introduce the industry on a large scale.

In 1856 W. R. Prince, of Flushing, L. I., contributed an article in *The Horticulturist*, Phila., on the cultivation of licorice root in the United States, showing the possibility of it. In 1854 the Department of Agriculture published in its annual report an account of its cultivation in this country.

In 1886 Mr. Isaac Lea, of Florin, near Sacramento, Cal., grew several acres very successfully, but abandoned it for want of a home market and for more profitable use of the land occupied by it. There are still some plants growing on that farm as well as in several other places in California. Mr. Lea was an enthusiast on the subject of growing the plant on a commercial scale, and had visited Louisiana and Florida with the object of establishing the enterprise in one or the other of those States; but finally abandoned the project for personal and domestic reasons. I mention these facts to show that the plant has been grown here by practical men whose opinion was that it could be grown on an extensive scale, but who knew nothing of the manufacture of the extract from it.

This paper is far from being exhaustive of the subject; much practical information has been accumulated and my experiments are still going on, and I believe with the necessary capital invested in the business on a sufficiently large scale, it need not be many years before the entire wants of this country, of licorice paste, could be supplied from the home-grown root, as indicated.

STRUCTURE OF IRIS.

By Edson S. Bastin.

The Blue Flag, Iris versicolor, *Linné*, is one of the commonest of monocotyls in the eastern United States. The range of its habitat is from Canada to Florida, and from the Atlantic as far West as Minnesota and the Indian Territory. Its rhizomes are horizontally creeping, from 16 to 24 cm. long, more or less branched, and composed of joints, each from 3 to 10 cm. in length, and representing a year's growth. Each joint at or near its base is cylindrical or only slightly flattened, but toward its apex is larger and widened hori-

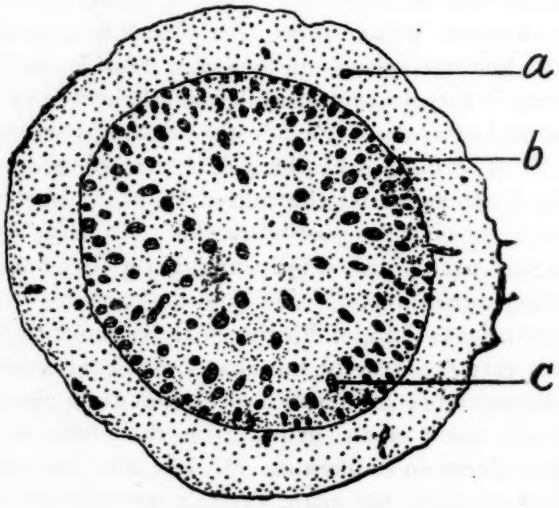

Fig. 1.

zontally. At the anterior end on the upper surface of each joint is a more or less cup-shaped scar of a flowering stem. At this end also may occur two, or sometimes four, lateral branches arranged opposite each other in pairs. The surface of the joints is densely covered with scales consisting of the fibrous bases of the decayed leaves, and from the inferior surfaces, chiefly from the broader, flattened portion of the joints, spring numerous, sparingly branching, wrinkled rootlets, averaging 10 or 12 cm. long and about 1½ mm. in thickness. These, together with the scales, are usually removed in preparing the drug for market. The dried drug, therefore, shows, except occasionally near the apex of the rhizome, only the crowded

ring-like scars of the leaves and the small circular scars of the rootlets.

The rhizomes are also longitudinally wrinkled from shrinkage in

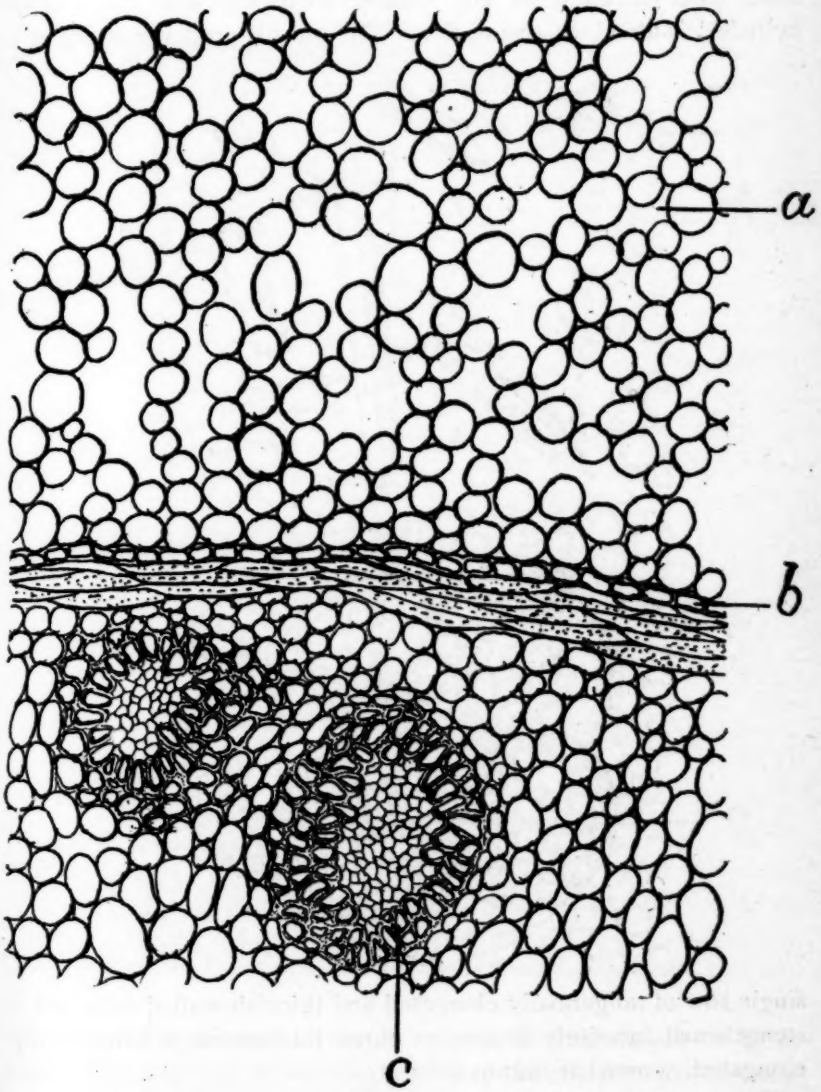

FIG. 2.

drying, are commonly banded transversely with different shades of brown on the outside; the fracture is short, and the fractured surface is usually brownish or grayish brown.

A transverse section of the rhizome shows a distinct cylinder-sheath separating the central cylinder, which contains numerous scattered vasal-bundles, from the cortex, which contains relatively few. The thickness of the cortex, compared with the central cylinder, is about as one to five. The sheath proper consists of a

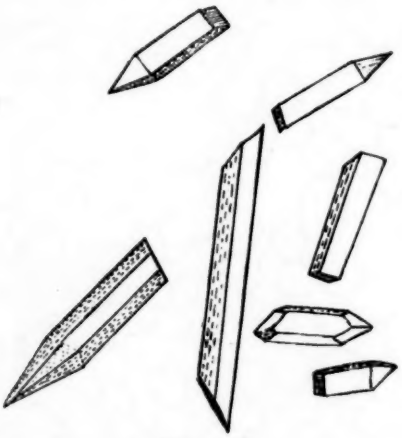

FIG. 3.

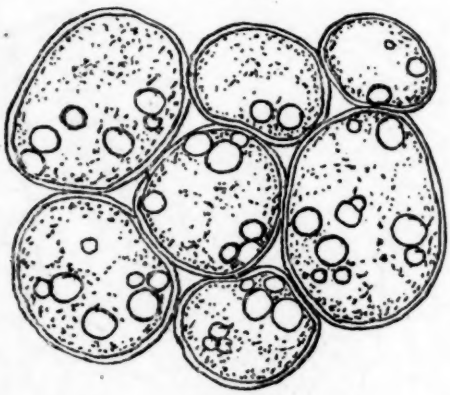

FIG. 4.

single row of tangentially elongated and thickish-walled cells, but is stengthened interiorly by two or three thicknesses of tangentially elongated, somewhat fibrous cells.

The vasal-bundles of the central cylinder are much more crowded toward the exterior of the cylinder next the sheath, and are mostly smaller than the more scattered ones toward the centre of the stem.

The bundles consist of that modification of the concentric type in which the xylem elements are exterior, and the phloem tissues central, and, as seen in transverse section, the bundles are either circular or somewhat elliptical in outline. The ducts are of rather small

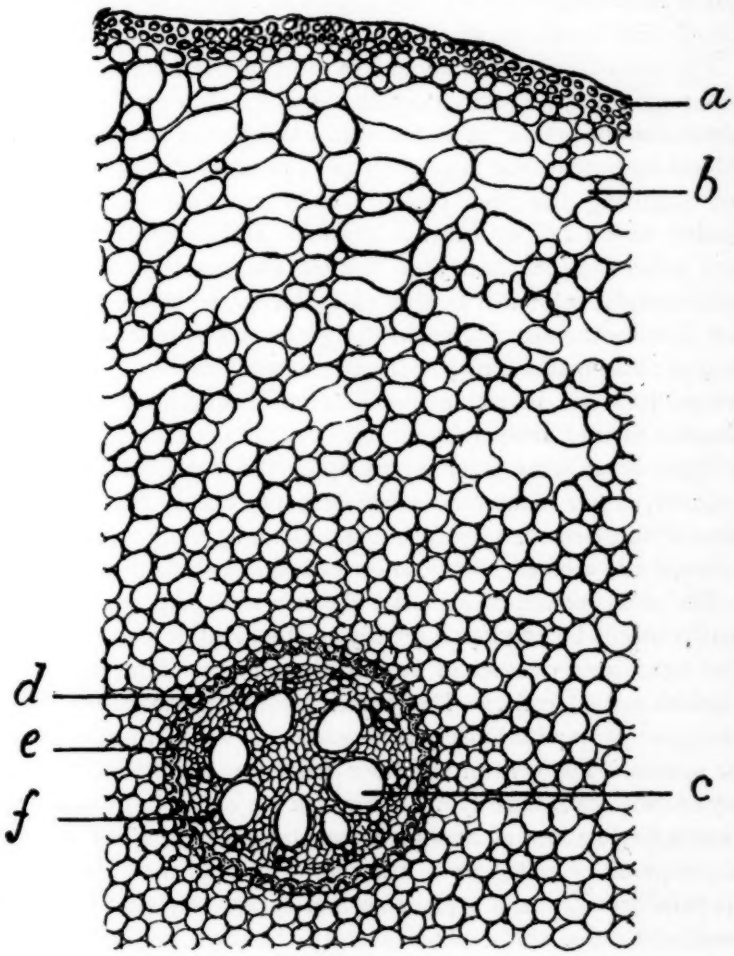

FIG. 5.

size. Each bundle has an imperfectly developed sheath of thin-walled cells, differing little from the cells of the adjacent parenchyma except in their smaller size.

Aside from the xylem elements of the bundles and the cylinder-sheath with its strengthening layer of fibrous elements, the tissues

of the rhizome are unlignified. The cortex and fundamental tissues of the central cylinder consist of loosely arranged parenchyma. The cells of this parenchyma are notably unequal in size, and the intercellular spaces, though often large, are not regular either in size or in arrangement as they commonly are in the stems of other aquatic and marsh plants.

The parenchyma cells abound in rounded granular particles which look remarkably like starch grains, but which do not polarize light, and which stain brownish instead of blue with potassium-iodide iodine. In chloral-hydrate iodine they swell and gradually disappear, but without acquiring the blue color of ordinary starch. If sections be treated with a 15 per cent. solution of alpha-naphthol, afterwards with sulphuric acid, and then heated, the grains disappear and an intense violet color will be gradually developed in the tissues. This test justifies the suspicion that the grains, though behaving in some respects like proteid, may really be carbohydrate in their character, related to, if not in fact a modification of starch. But this matter requires further investigation.

There occur in the parenchyma, both of the cortex and of the central cylinder, rather numerous isolated crystals of calcium oxalate in the form of large-sized, mostly elongated and pointed prisms, which, between the crossed Nicols, show beautiful polarization effects.

The cross-section of a rootlet shows a structure so characteristic that it might be employed readily in the identification of the drug. The epidermis consists of two or three layers of rather small and thickish-walled cells. The cortical parenchyma consists of very unequal-sized, quite loosely arranged cells, with irregular intercellular spaces. The central bundle is from ten to fifteen rayed. The rays terminate interiorly in about six or eight large ducts, which form a circle about a small pithy central portion. The endodermis is composed of cells very distinct from those of the adjacent tissues. Its cells are of nearly equal size and excessively thickened in their inner and radial walls, which are also lignified, while their exterior walls remain thin and unlignified.

DESCRIPTION OF FIGURES.

Fig. 1.—Diagram of cross-section of rhizome of Iris versicolor, the section passing through near the base of one of the joints; *a*, a vasal-bundle in the cortex; *b*, cylinder-sheath; *c*, a vasal-bundle in the central cylinder. Magnification, 6 diameters.

Fig. 2.—Small portion of cross-section of same rhizome more highly magnified, showing portions of cortex, cylinder-sheath and central cylinder. *a*, in tercellular space in cortex; *b*, cylinder-sheath; *c*, xylem of one of the bundles in exterior portion of central cylinder. Magnification, 100 diameters.

Fig. 3.—Crystals of calcium oxalate from rhizome. Magnification, 150 diameters.

Fig. 4.—A few parenchyma cells from central cylinder of rhizome, showing granules similar in appearance to starch grains. Magnification, 495 diameters.

Fig. 5.—Portion of cross-section of root of Iris versicolor, magnified 100 diameters. *a*, epidermis; *b*, cell of cortical parenchyma; *c*, large duct in vasal-bundle; *d*, endodermal cell; *e*, pericambium cell; *f*, small ducts at exterior end of xylem ray.

IODIDES OF TIN.

By Charles Bullock.

Iodide of tin has been called for recently in medical practice for its supposed benefit in some forms of pulmonary disease.

Tin forms with iodine two compounds—stannous iodide, SnI_2 and stannic iodide, SnI_4. *Stannous Iodide* is formed when iodide of potassium is added in slight excess to a solution of stannous chloride. The solution must be made free from excess of acid by long digestion at a moderate heat in a flask over mossy tin.

The iodide is precipitated as a yellow-red powder, somewhat gelatinous in character. When thrown upon a filter the filtrate is quite acid, and the iodide when washed soon turns white by decomposition, forming oxide of tin and hydriodic acid. If heated in a flat porcelain dish without washing it evolves hydriodic acid and changes to a brown-red powder. The best method was found to be the drying of the precipitate immediately between folds of bibulous paper. In this condition it still remains acid when dry.

Stannous iodide crystallizes in yellowish-red needles; it dissolves slightly in water and soon decomposes with formation of hydriodic acid and oxide of tin. In warm solution of the chlorides and iodides of the alkali metals it dissolves freely. When heated to near redness in the absence of air it liquefies, but does not sublime; on cooling, it solidifies into a crystalline mass, which affords a yellow-red powder. When heated in an open vessel it is resolved into stannic iodide, which sublimes, and oxide of tin is left.

Stannic Iodide, SnI_4 (tetra iodide) is obtained when tin and iodine are brought together in a dry state. To prepare it, tin in a granular condition is placed in a flask, and twice its weight of

iodine gradually and carefully introduced. To prevent violent reaction it is recommended to moisten the tin with carbon disulphide before introducing the iodine, but this is not necessary if proper caution be used. The contents of the flask liquefy by the heat generated; when the reaction is over, the flask is heated and shaken to insure complete combination. When cold, the iodide solidifies to a mass having a chocolate color, and crystalline in structure. The mass was placed in a porcelain dish, covered with a funnel having a long neck with a small flask on the top. It melts at about 150° C., and the stannic iodide sublimes at about 180° C., collecting in the funnel in yellow-red octohedral needles. The stannous iodide which forms part of the mass does not sublime when air is excluded even at a red heat. By this method the two iodides can be separated.

Stannic iodide has a specific gravity of 4·69, it is soluble in carbon disulphide, absolute alcohol, methyl alcohol, ether, chloroform, benzol and oil of turpentine. It is quite sparingly soluble in water; the aqueous solution soon decomposes into hydriodic acid and stannic oxide.

It is not clearly stated which of the two iodides is wanted for medical purposes, and, as their therapeutic effects may vary very much, more information is wanted before they can be dispensed with safety.

Specimens of the two iodides are herewith submitted.

PHARMACEUTICAL NOTES.

By F. W. Haussmann.

IRON IN COMMERCIAL GLYCERIN.

The practice of keeping glycerin in tinned iron cans, often for a prolonged time, will have the effect of contaminating the same with traces of the metal.

As special inducements are usually offered by the wholesale dealers to buy this liquid in lots of 50 pounds, cans of this capacity containing the same are generally found in retail pharmacies, and often form the only stock container, with the consequence of the above-mentioned contamination.

In many operations, both in the laboratory and on the prescription counter, the delicate iron reactions produced with certain com-

pounds are productive of color changes, which are at times difficult of explanation.

These may be produced by impure articles, in this instance the iron-contaminated glycerin.

In a number of instances, where glycerin was kept in the containers mentioned, such reactions were produced and found at times to be the source of considerable trouble.

It is hardly necessary to mention the various iron reactions, as they are found in every chemical text-book.

But to the pharmacist a few are of importance, as they are liable to occur at the dispensing counter, when the presence of a trace of iron in commercial glycerin is not suspected.

PREPARATIONS OF TANNIN AND GALLIC ACID.

In the popular glycerite of tannin we find the preparation not unfrequently to turn a blackish-brown color, no matter how careful we may be in the handling of our working utensils.

Examination of the glycerin, which appears to contain the metal in the ferric form, will reveal the cause of the coloration.

Extemporaneously prepared nipple washes, containing tannin, or similar preparations, are apt to show the same effect, as will also preparations containing tannin-like principles.

In connection with this, attention may be called to the presence of tannin in commercial alcohol.

The average pharmacist accepts this most important solvent from his dealer without even attempting a superficial examination as to its purity, and does not recognize the importance of the same until he finds color changes in delicate preparations.

Elixirs containing scaled iron salts often show this result, and the question: Why does elixir iron, quinine and strychnine turn dark after standing a short time? may find partly an explanation in the tannin-containing alcohol of commerce.

Such alcohol, or preparations made therefrom, when mixed with glycerin kept in tinned iron cans, will show the same effect.

EFFECT UPON PHENOL COMPOUNDS.

The delicacy of the iron reaction with phenol compounds is well known.

Carbolic acid is frequently prescribed in a mixture with glycerin

and if the latter is not free from iron, a red coloration is sure to take place.

This was observed with a perfectly colorless sample of the acid.

Salicylic acid, in particular its sodium salt, is a compound which is readily affected in this manner. The fact that a perfectly colorless aqueous solution of this salt, when mixed with glycerin, turned to a reddish violet color, first drew the writer's attention to the presence of the metal in the latter.

Similar effects can also be observed with other aromatic compounds, especially with a number of the new remedies, such as antipyrine, salipyrine, etc.

The following prescription was the subject of a controversy between a physician and a pharmacist:

Tinct. Guaiaci,
Glycerini, āā ℥ i
Aquæ Rosæ, ℥ ii.

When this mixture was dispensed, it was found to acquire a blue color on standing.

This took place either with or without the presence of gum arabic, thereby proving the same not to be a factor in the change.

An examination of the rose water failed to find any oxidizing agents, but an examination of the glycerin revealed the presence of iron.

The same prescription was sent to several reputable pharmacists to be compounded for the sake of comparison, almost invariably showing the same result, with only one exception, indicating the presence of iron in glycerin to be quite general.

Other color reactions, produced by this impurity, may also take place, but a consideration of analytical principles will enable the well-informed pharmacist to satisfactorily explain the cause of any such changes.

THE ADDITION OF GLYCERIN TO BORAX PREPARATIONS.

The fact that glycerin, when added to aqueous solutions of borax decomposes the latter with formation of free boric acid is well known.

The frequently asked query: What is the cause of the effervescence in preparing Dobell's solution? finds its explanation in this manner, also the pharmacopœial identity test for glycerin.

The same reaction may take place in other instances, perhaps less frequently, yet being at times of importance at the dispensing counter, occasionally requiring some reflection before unlooked-for phenomena are satisfactorily explained.

Some weeks ago a mixture consisting of aqueous tincture of rhubarb and glycerin was found to explode when dispensed in a well-filled bottle.

When this mixture was prepared in an open vessel, distinct effervescence could be observed on standing.

Tinctura rhei aquosa, a preparation frequently prescribed by German practitioners, contains, besides the active vegetable ingredient, borax and potassium carbonate.

The glycerin decomposes the sodium borate, with liberation of free boric acid, and the latter is again neutralized by the potassium carbonate present with evolution of CO_2.

The expansion of this gas renders the bottle holding this mixture liable to fracture.

BORAX IN UNGUENTUM AQUÆ ROSÆ.

Several objections have been made against the addition of borax to the cold cream of the new Pharmacopœia.

The action of the borax upon salts of mercury and the alkaloids appears to be the chief objection.

The addition of glycerin to cold cream, as sometimes ordered extemporaneously in prescriptions, will also decompose the borax in the manner mentioned.

Borax appears to possess some saponifying action upon the fatty ingredients, and if glycerin is subsequently added, boric acid is liberated, changing the reaction of the ointment from alkaline to acid.

It would be interesting to know whether this would produce an impairment of the preparation as to its medicinal value.

GLYCERIN AND SOME BAY RUM SAMPLES.

The pharmacopœial bay rum formula is not satisfactory to many pharmacists on account of the almost colorless appearance of the product.

In their efforts to cater to the popular taste, they prefer to have the preparation of a bright yellow, or even yellowish-brown color.

To effect this, some follow the practice of macerating bay leaves or turmeric, or both, in the solution of the oils, while others add solution of potassa to the oils of bay and allspice before dissolving them in alcohol.

Some also dissolve a certain amount of borax in the water before it is added to the alcoholic oil solution.

Still others use the potash solution and make the borax addition besides.

When the last method is employed the bay rum will possess a handsome yellow color.

But if the preparation, thus prepared, is mixed with glycerin, the effect repeatedly mentioned takes place, namely, the borax is decomposed and the acid liberated.

This effect may readily be observed after the glycerin addition.

The mixture will decolorize, the yellow color almost entirely disappears, and the previously alkaline bay rum will turn distinctly acid to test paper.

Other illustrations may be mentioned, where chemical incompatibility may arise between borax and glycerin, but a little reflection will readily indicate the liability of its occurrence.

In the preparation of toilet washes, in which it is desirable to keep the borax unchanged, this fact must be considered with care.

One point we may perhaps call attention to, namely, the chemical incompatibility of borax with fluid extracts and tinctures containing glycerin.

Astringent fluid extracts, such as those of sumach berries, rose, etc., as a rule, contain glycerin, and it is well known that these preparations enter frequently into mouth washes containing borax.

VINEGAR OF SQUILL.

Considerable variation appears to exist in the color of this preparation.

As usually found in the United States it is yellow, due to the employment of the white variety of the drug in its preparation.

Occasionally, however, we find the red variety of squill in our market, and this is especially the case with the ground drug.

Vinegar of squill, made from this variety, is red-brown, appears to have a more pronouncedly bitter taste, which it will communicate to the syrup made therefrom, and which will also have a similar color.

As the syrup is a frequently sold article, the altered taste and color is at times regarded with suspicion by the consumer.

Having occasion to examine a number of samples of the vinegar, the writer noticed in several the odor of acetic ether. Further examination revealed also the presence of alcohol. Such vinegars mostly had a cloudy appearance, and a sample, prepared by the writer from the fluid extract, according to the formula of a certain manufacturing firm, possessed the identical properties after standing, both in odor and appearance.

Fluid extract of squill, a preparation largely alcoholic, appears to have been used in the preparation of these vinegars, and consequently the alcohol and acetic acid entered into combination to form acetic ether.

On heating the vinegar, the latter is dissipated, together with the excess of alcohol, hence the odor of the ether is not so prominently noticeable in the syrup made by heat.

The practice of "easy preparation" of this official vinegar should be discouraged.

It is not only a flagrant disregard of the Pharmacopœia, but a preparation of this kind will, by its odor, reveal the professional principle of its maker.

ULTRAMARINE IN SYRUPS.

The addition of this pigment to sugar by the refiner, for the purpose of "whiting," the same, is to the pharmacist at times the source of not a little trouble, not alone in the preparation of medicinal syrups, elixirs and allied saccharine preparations, but also in the manufacture of soda water flavors.

The altered appearance of the finished syrup, differing from the expected colorless preparation, showing the same to possess a brownish tint, is a frequent source of chagrin, although liable to happen when made from the best variety of granulated sugar.

The Pharmacopœia recognizes this fact, and requires large volumes of syrup not to deposit any sediment on standing.

From a chemical standpoint another factor may be noticed, equally important as the mentioned physical change, namely, the occasional evolution of hydrogen sulphide from certain syrups.

This has probably been noticed by many pharmacists, but the odor has been erroneously attributed to the "souring" of the syrup; in other words, to fermentation.

From the fact that evolution of the hydrogen sulphide gas only took place in the syrup, containing free acids, the writer drew the conclusion that it must be due to another cause.

A number of experiments led him to the conclusion that the source laid in the ultramarine, added, as already stated, for the purpose of "whiting."

To understand the reaction, by which the evolution of the gas is produced, the composition of the pigment must be briefly noticed.

The exact constituents are not well known, but ultramarine is stated to be mainly a mixture of aluminum silicate, containing traces of iron, together with various sodium compounds, predominant among which is the sulphide. When free acids act upon the latter, hydrogen sulphide is evolved.

If this takes place in medicinal syrups, it is recognized by its odor or by suspending a strip of white paper moistened with lead acetate solution in the air space above the syrup in its container.

Syrups containing mineral acids claim our first attention. Of these the most important official ones are those containing free phosphoric or hypophosphorous acid, also the syrup of hydriodic acid.

These acids will decompose the blue readily in the manner mentioned.

The action of acids upon the pigment is not confined to inorganic acids, but the organic produce a like effect.

Among the latter may be mentioned citric, acetic, tartaric and oxalic acids.

Syrup of the former acid, official in the Pharmacopœia, is not rarely affected, as well as the hypophosphite syrup of the last Pharmacopœia, which also contained this acid.

Syrups containing acetic acid, such as ipecac, garlic, and squill, will also show the same effect, although in not as characteristic a manner, as, for instance, in the case of garlic syrup one odor will mask the other.

Among other official syrups likewise subject to this change, syrup of gum arabic may be mentioned.

The mucilage of acacia has an acid reaction, and its mixture with simple syrups, containing ultramarine in suspension, will be found to acquire an offensive odor on prolonged standing.

Incidentally may be mentioned, that the same effect is noticeable in

Jackson's pectoral syrup, although the odor is masked by the presence of oil of sassafras.

Even simple syrup itself, when turning somewhat sour, will have the odor of the gas, if the ultramarine has not been carefully removed.

Of inconvenience this fact will also be found in the manufacture of soda syrups, especially those containing free acid or acid fruit juices.

The repulsive odor of some fruit syrups, after undergoing this decomposition, is thereby explained.

It is noticeable at times that the ultramarine in syrups containing free acid gradually disappears on standing.

The pigment is usually not found in acid syrups prepared by heat, as decomposition of the blue takes place more rapidly during this procedure.

Syrups containing free alkali, such as rhubarb and senega, do not evolve sulphuretted hydrogen, as the ultramarine remains unaffected by alkalies.

Incidentally the recommendation of the Pharmacopœia, to prepare syrups by cold percolation, must be called wise and practical. If carefully prepared and preserved, it not only obviates the possibility of recrystallization of the sugar, but will also remove foreign matter, which will at times occasion deposits or even induce fermentation.

In the presence of the ultramarine pigments the intervention of the sponge will remove the blue in neutral or alkaline syrups.

Even if it should be decomposed in syrups containing acids, the exposure of the same, being yielded drop by drop in the course of its preparation, should be sufficient to expel all appreciable traces of the hydrogen sulphide gas.

NOTES ON SOME SAPS AND SECRETIONS USED IN PHARMACY.

By P. L. Simmonds, F.L.S.

There are very many of these which deserve special detailed notice, at all events as to their medicinal uses and statistics.

Four subdivisions might be established under which all the varieties of gums and resins might be grouped:

(1) Gums.
(2) Resins.
(3) Oleo-resins.
(4) Elastiçs and gums.

The first would include all gums, wholly or partially soluble in water, whether of the Acacia or Tragacanth kind.

The second would include resins more or less soluble in alcohol, such as copals, mastics and gum resins, like asafœtida and ammoniacum.

The third would include turpentine, wood oil and balsams.

The fourth would contain India-rubber, balata and gutta-percha, with substances of a similar character.

A resin is entirely soluble in alcohol, but insoluble in water. A gum resin is intermediate in character between a gum and a resin; that is to say, it is partly soluble in water and partly soluble in alcohol.

A kino is the astringent inspissated sap of a tree.

The resins may be divided into four groups:

(1) Solid or dry resins.
(2) Turpentines.
(3) Balsams.
(4) Soft resins.

Perhaps it is better to arrange the products alphabetically under their botanic names.

Abies balsamea, Marshall; *Abies balsamifera*, Michaux; *Pinus balsamea*, Lin.

Canada balsam is an oleo-resin produced from the stem of this tree by incision, and is also yielded by *Pinus Fraseri*, Pursh.

It is of a pale straw color, and is occasionally used medicinally, but is chiefly employed for mounting objects for the microscope, and as a fine transparent varnish for water-color drawings, which does not become darker with time.

Abies excelsa, Poiret; *Pinus picea*, Du Roi.

Pinus Abies, Lin. The resinous exudation of the Norway spruce fir, melted and strained, furnishes the concrete oleo-resin, true Burgundy pitch, the Thus or Frankincense of the London Pharmacopœia. The common frankincense or American Thus is from *Pinus palustris*, Lambert; *Pinus Tæda*, Lindl. It acts as a counter-irritant, and is applied to the chest in chronic pulmonary complaints,

to the loins in lumbago, and to other parts to relieve local pains of a rheumatic character.

The Indian gums are coming in largely into European commerce to supplement the African gums, the exports of gums for India having averaged 37,000 cwt. in each of the last five years. The African gums may be recognized from Indian gums by an expert, being of a different shade of color, often with a pinkish hue. The imports of gum arabic into the United States have declined by more than one-half of late years; in 1892 they were only 417,000 pounds, but recovered in 1893 to 915,855 pounds.

Acacia Catechu, Willd. The extract from this tree, known as "cutch," is used medicinally as an astringent, in fevers and other maladies, and the better qualities are equally as good medicinally as the Gambier of Singapore.

There are several kinds of cutch made in India and used in medicine.

A resinous extract is prepared by boiling down chips of the wood.

In Burma and Bombay the decoction is boiled down to a solid consistence and thrown into leaf moulds, or is baked into cakes and balls. This is the ordinary cutch of commerce, and instead of being a pale grayish color, it is deep reddish-brown, with a glassy fracture.

Another inferior kind is made from a decoction of the nut of the betel palm (*Areca Catechu.*) This form exists in large slabs, about an inch in thickness, prepared on the leaves of the Teak tree. This substance is, however, rarely exported from India, but a considerable local trade is carried on in it in Madras and Mysore.

Cutch is prepared thus:

The tree is cut down to about six or twelve inches from the ground and chopped into small pieces, the smaller branches and bark being rejected. The chopped wood is then taken to the place of manufacture, generally under trees in the open air, and placed over a brisk fire in clay jars, filled with about two-thirds of water.

This is allowed to boil down till, with the extracted matter, it forms a liquid of a syrupy consistence. The contents of several jars are then poured into a larger jar, and again placed over a brisk fire for a period of from two to four hours, and, when sufficiently boiled down, it is poured over mats covered with ashes of cowdung and allowed to dry.

Catechu is used in medicine as a gentle tonic and a powerful astringent, on account of the large quantity of tannic acid (50 per cent.) which it contains. Combined with opium it answers a good purpose as an internal remedy in chronic diarrhœa, catarrh or dysentery.

Cutch is not specified in the American imports, but gambier is named, but appears among gums, with the old misnomer of "Terra japonica." The quantity imported fluctuates between 27,000,000 and 35,000,000 pounds.

SUGARS.—The maple tree, several palms, the white beet root, sorghums, the sugar cane, and other plants and trees, yield saccharine saps, but as the product of these have chiefly dietetic uses, rather than medicinal, I shall not enter into details on them.

Aloes Species.—The simply inspissated juice of the leaves of various species of this gum constitutes the "aloes" drug of pharmacy. It is best obtained by using neither heat nor pressure for extracting the sap. By redissolving the aqueous part in cold water and reducing the liquid through boiling to dryness, the extract of aloes is prepared. All species are valuable in localities where they are hardy, and can be used (irrespective of their medicinal importance) to beautify any rocky or otherwise arid spot.

Aloe Ferox, Lamarck.—This yields the best Cape aloes, as observed by Dr. Pappe. Other species, such as *A. perfoliata*, Lin., also yield the drug. *A. africana*, Mill., and *A. plicatis*, Mill., and *A. commelini*, Salm., are said to yield a less powerful kind.

The following are also South African species: *A. arborescens*, Miller; *A. linguæformis*, Mill.; *A. angulata*, Willd. From this species the purest gum resin is obtained.

A. purpurascens, Haworth, is one of the plants which furnish the Cape aloes of commerce. *A. spicata*, Lin., also provides Cape aloes. *A. Zeyheri*, Harvey, a magnificent, very tall species, is doubtless valuable like the rest. *A. soccotrina*, Lamarck., is also indigenous to South Africa; *A. dichotoma*, Lin. fil., in Damara and Namaqualand, attains a height of 30 feet and expands occasionally with its branches so far as to give a circumference of 40 feet. The stem is remarkably smooth, with a girth sometimes of 12 feet. It is a yellow-flowering species. *A. Bainesii*, Baker and Dyer, is almost as gigantic as the foregoing. Both, doubtless, yield the medicinal gum resin, like several others.

In many parts of the Colony of Natal, a wild aloe is very abund-

ant, and a few people make an industry of the preparation of the product for export. Shipments, of late years, have reached £400 in value. Small balls of it were shown in the Natal Court at the Colonial Exhibition in London.

A. indica, Royle.—There are many varieties of aloe met with in cultivation throughout India, some of which have gone wild, as, for example, on the coast of South India. The inspissated juice, as a medicine, is regarded as an aperient and deemed highly beneficial to persons predisposed to apoplexy. The fresh juice from the leaves is said to be cathartic, cooling and useful in fevers, spleen and liver disease, enlarged lymphatic glands, and as an external applicant in certain eye diseases. The pulp of the leaves is, in native practice in India, applied to boils and is regarded as acting powerfully on the uterus. It is largely employed in veterinary medicine. The root is supposed to be efficacious in colic. *A. soccotrina*, Lamarck; *A. vera*, Miller, is usually imported in skins and casks from Bombay. Soccotrina aloes may be recognized by its reddish tint and by the fragments being nearly transparent, as well as by its odor. *A. Perryi*, Baker, is indigenous to the island of Socotra. In very large doses it is a powerful hepatic stimulant. In small doses the drug is used as a stomachic tonic, in larger doses purgative and, indirectly, emmenagogue. It is a remedy of great value in constipation caused by hysteria and atony of the intestinal muscular coat. It is also very useful in atonic dyspepsia, jaundice, amenorrhœa and chlorosis. Locally applied, dissolved in glycerin, it is valued in India as a stimulant application in skin diseases, and, for this purpose, is generally combined with myrrh, constituting the *Musanbar* of Bombay.

Hepatic aloes is a species of Arabian aloes, so called from its liver hue. It is duller and more opaque in color than other kinds, more bitter, and has a less pleasant aroma than the Socotrine aloes itself, but is believed to be the sediment deposited in Socotrine aloe juice.

A. vulgaris, Lamarck and Bauhin; *A. vera*, Lin.; *A. Barbadensis*, Miller, has long been cultivated in the Antilles, and furnishes from thence the main supply of the Barbadoes and Curacoa aloes.

This West Indian aloes may at once be distinguished by its disagreeable odor.

There are two varieties met with in commerce, one presenting a brown, the other a black fracture; the former is the best.

The culture in Bar adoes is confined to the small farmers entirely,

and is carried on chiefly in the parish of St. Philip, towards the sea-shore, where the soil is scanty and dry. The produce of an acre of land is about 140 pounds of extract. The plants require to be renewed about every fourth year.

It is this species which Professors Willkolm and Parlatore record as truly wild in countries around the Mediterranean Sea, on the sandy or rocky sea coasts of Spain and Italy. Haworth found the leaves of this and of *A. striata*, more succulent than those of any other aloe.

Barbadoes aloes is usually imported in gourds, breaks with a dull conchoidal fracture, and has a bitter taste. Socotrine breaks with an irregular or smooth and resinous fracture, has a bitter taste and a strong but fragrant odor.

In my work on "The Commercial Products of the Vegetable Kingdom," published as far back as 1853, I described the production and commerce in Aloes, but much information has been published since then. The imports into London have been falling off of late years.

In 1890 the receipts were 7,360 cases and packages and 622 gourds; in 1892, they were only 2,652 cases and 277 gourds.

Anacardium occidentale, Lin.—The trunk and branches of the cashew-nut tree yield, on being wounded, during the monthly ascent of the sap, a white and transparent gum, similar to that of arabic. A full-grown tree will furnish an annual amount of ten or twelve pounds. The fresh acid juice of the flower stalks is used in lemonade; wine and vinegar are made by fermenting it.

Anogeissus latifolia, Wall.—The gum from this Indian tree occurs in clear, straw-colored, elongated tears, adhering in masses, sometimes honey-colored, or even brown from impurities. As an adhesive gum it is inferior in strength to gum arabic, in consequence of which it commands a much lower price in Europe, the more so since it is nearly always mixed with the bark of the tree, sand and other impurities.

BALSAMODENDRON SPECIES.

B. Ehrenbergi, Berg.—This species of the deserts of Arabia yields myrrh, and some other species produce the same resin. Professor Oliver unites this with *B. opobalsamum*, Kunth, which furnishes Mecca or Gilead balsam.

B. africanum, Arnott; *Heudelotia africana*, Rich.; *Amyris niottout*, Adans.

African bdellium is translucent, but has a dull fracture. The taste is slightly bitter.

B. kataf, Kunth; *Amyris kataf*, Forsk., furnishes the gum resin or African bdellium, which reaches Bombay from Berbera, the purer kinds very much resembling myrrh in perfume. The opaque bdellium of Guibourt is used for the extraction of the Guinea worm. It is of a yellowish white color, resembling ammoniacum.

B. mukul, Hooker, of Scinde and Beloochistan, furnishes the Indian bdellium, or "Gugul," which is used in native medicine as a demulcent, aperient, carminative and alterative; especially useful in leprosy, rheumatism and syphilitic disorders. It is also prescribed in nervous diseases, scrofulous affections, urinary disorders and skin diseases, and is employed in the preparation of an ointment for bad ulcers. A fragrant balsam is obtained in Arabia from the fruit of this species. The African bdellium is the product of another species.

B. myrrha, Nees.—This tree of Arabia and Africa yields the myrrh of commerce, which occurs in the form of tears, of irregular shape, of variable size, and of a yellow or reddish-yellow color, light, brittle, somewhat translucent, and at times shining. Fracture vitreous or conchoidal, of a bitter aromatic taste and peculiar smell. It contains a volatile oil, was used in ancient times as "frankincense," and is still so employed in China. Myrrh is used as a stimulating medicine, and as an ingredient in tooth powders. Bombay is the chief port at which myrrh is received and shipped. Four kinds are imported there: the African or true myrrh, which is considered the best quality; the Arabian, the Persian (source unknown), and the Siam. On the bags arriving at that port, they are opened and sorted into the different kinds.

The Aden agents of Bombay houses attend the annual fair at Berbera, and exchange goods for the gum resins. The bags or bales, when opened in Bombay, are found to be made up of (1) a large proportion of roundish masses of fine myrrh; (2) of a considerable proportion of small, semi-transparent pieces of myrrh of irregular shape; (3) of numerous pieces of dark-colored myrrh, mixed with bark and other refuse; (4) a small proportion of an opaque bdellium. When sorted the best myrrh goes to Europe, the darker pieces form a second quality and the refuse is exported to China, where it is probably used as incense.

Myrrh is beneficial in dyspepsia, amenorrhœa and chlorosis, and a

useful astringent to all ulcerations or congestions of the mucous membrane. It makes a valued wash for the mouth and gums and a gargle in ulcerated sore throat. It is a stimulant, expectorant, and much admired as a remedy for pulmonary affections, especially the asthma of the aged. Hakims, in India, use it for intestinal worms. It is detergent, siccative, astringent and aperient, a disperser of cold tumors and one of the most important of medicines, as it preserves the humors from corruption. Dissolved in milk it is dropped in the eye in purulent ophthalmia. It is useful in humid asthma and chronic catarrh, also in chlorosis and defective menstruation. Dose, in pill, powder or emulsion, 10 to 30 grains; of tincture, ½ to 1 fluiddrachm.—Dr. George Watt.

B. opobalsam, Kunth; *Amyris opobalsam*, Lin.—This tree furnishes the balsam or balm of Gilead, which is not a true balsam, but an oleo-resin of a consistence like that of Chian turpentine. It has a fragrant odor and warm, aromatic taste, and was held in high esteem by the ancients, and accredited with a variety of medicinal properties. As a cosmetic and perfume it is still largely employed by Turkish ladies. There are references to it by many ancient writers, among others, Theophrastus, Dioscorides, Pliny and Galen, and also many mentions of it in the Bible. So highly prized was this balsam that, during the war of Titus against the Jews, two fierce contests took place for the orchards in Jericho, where it was produced, the last of which was to prevent the Jews from destroying the trees that the trade might not fall into the enemy's hands. The gardens were taken formal possession of as public property, an imperial guard was appointed to watch over them, and it appeared that the emperor increased their size and endeavored to propagate the plants. The imperial care was unavailing, for not a branch of the balsam tree is now to be found in all Palestine. The shrub was taken to Arabia and grown in a recess in the mountains between Mecca and Medina, whence the balsam is now exported, not as balm of Gilead, but balsam of Mecca. The substance is still eagerly sought for in Egypt and the East under this name. It is obtained by making incisions in the trunk or branches, but the yield is very small, only averaging three or four drops per diem. This fact accounts for the comparative rarity and the great costliness of the genuine article, as also for the numerous substitutes and imitations of the original. There are three qualities produced by art; the first and best is the opobalsam,

expressed from the green berry and leaves; the second is the carpobalsam from the ripe seed or berry; and the last is obtained by bruising and boiling the young wood. The twigs, possibly after boiling, are sent to Venice, where they enter into that heterogeneous compound—Venice treacle.

B. Roxburghii, Lin.—This yields a gum resin of a greenish color, moist and easily broken, having a peculiar cedar-like odor.

Boswellia Carterii, Birdwood.—The Frankincense of commerce. This stimulating gum resin is also obtained from *B. Frereana* and other species; it is used medicinally and as a perfumery incense. The European frankincense is, however, distinct, being a resinous exudation from the spruce fir, used in the composition of plasters.

Olibanum consists of tears, often an inch in length, of an ovate or oblong clavate or stalactite form, and mixed with impurities. The pieces are light yellow to brown, pale green or colorless. There are two varieties, one of which is far inferior to the other. The best is found in pieces as large as a walnut, of a high yellowish color, inclining to red or brown, covered on the outside with a white powder, the whole becoming a whitish dust when pounded. It burns with a clear and steady light, not easily extinguished, and diffuses a pleasant balsamic and resinous fragrance. This drug is constantly burnt as incense in the Hindu temples, under the names of "Khomda" or "Kunda" and "Luban," and also in Roman Catholic churches.

Bombay is the port from whence the greatest quantity is exported. England receives from 7,000 to 8,000 packages yearly. Olibanum is rarely used in medicine in Europe, but in India it is regarded as a demulent, aperient and alterative, acting chiefly on the lungs and as a purifier of the blood. It is there used in rheumatism, nervous diseases, scrofulous affections and skin diseases. It is regarded as a diaphoretic and astringent, and is employed in the preparation of an ointment for carbuncles, boils, ulcerations and other sores. As a fumigating agent, it is employed to overpower unpleasant odors and to destroy noxious vapors.

B. glabra, Roxb., also yields this fragrant resinous substance. It is bitter and pungent; mixed with "ghee" or fluid butter, the native doctors prescribe it in gonorrhœa and other complaints.

B. serrata, Stackh., is sometimes called the Indian olibanum tree. Of this there are two varieties, one being the *B. thurifera* of Rox-

burgh and Colebrooke, and the other *B. glabra*, noticed above. The gum resin occurs as a transparent golden yellow semi-fluid substance, which hardens with time. It has a slightly aromatic and balsamic resinous odor.

B. Thurifera, Coleb.; *B. serrata*, Stackh. This and some other species yield the gum resin. It has astringent and stimulant properties. Externally, it is useful as a rubefacient and antispasmodic, especially as a plaster in cramps of the stomach.

[*To be continued.*]

THE APOCYNACEÆ IN MATERIA MEDICA.

By George M. Beringer.

(*Continued from page 46*).

In structure the fruit of *Holarrhena Antidysenterica* approaches, in the main, that of strophanthus. Externally, is the epidermis with cells distinct and thickened on the outside. The mesocarp is formed of a fundamental tissue in which the cells are not flattened or pressed, but are distinctly visible without the aid of potassa. These cells have granular contents, the walls reddish-brown, and in the external zone, thickened nearly collenchymatous.

The internal region forms a fibro-vascular zone with white or yellowish white, very thick fibres, and vascular fascicles rounded or flattened, and with numerous laticiferous vessels. The endocarp is analogous to that of strophanthus.

The seeds of Holarrhena are quite small, 10 to 20 m.m. in length, 2 to 2½ m.m. in breadth, and 1 to 1½ m.m. in thickness. It requires forty of these seeds when dry to weigh 1 gramme. The shape is oblong, straight, elongated; the extremities somewhat attenuated, but blunt. The lower extremity is somewhat pointed, the upper bears a sort of collar, a very small swelling, upon which is inserted the characteristic tuft of hairs, but in commerce, these hairs are always absent. The seed is flat, or rather plano-convex, the dorsal face a little rounded, the ventral face flat or even concave in grooves. The margins of the seed enrolled a little toward this face, which is ordinarily marked by a small, whitish line extending from one extremity to the other. The color varies from a pale fawn or cinna-

mon with a little greenish, even to a chocolate brown. It is dull and ordinarily uniform.

The surface presents always quite large ridges, due to drying, but is not regularly and finely striated, as are those of Wrightia. Viewed with a lens, it is finely granulated, or even rugose. The fracture is easy, ordinarily greenish white, or at times brownish. The odor, while not marked, upon crushing approaches that of Strophanthus. The taste is frightfully bitter.

Macerated in water the seeds rapidly give to the liquid a disagreeable and nauseating odor and dissociate into their three elements. The envelope, brown and quite thin, often carries away with it the albumen in the form of a thin, peripheral sac of the embryo. The embryo is large, brownish; the cotyledons are refolded several times upon themselves, a little rumpled, but not rolled up. Five large nerves, well marked, start all at the base. The radicle is conical and relatively short. Sulphuric acid slowly produces, with the transverse section, a yellow coloration, changing to orange and finally red. The active principle is an alkaloid first isolated by Haines in 1858, and to which he gave later the name *conessine*. Stenhouse, in 1864, isolated from the seeds the same principle under the name, *Wrightine* and recently Warnecke obtained the *Wrightine* in a crystalline state.[1] The name *Wrightine* is still erroneously retained, as *Wrightia* does not yield this substance.

In India this drug is considered a valuable remedy against maladies of the bowels, especially dysentery. Its use is constant as a febrifuge, astringent and bitter tonic. It was imported into Europe toward the middle of the last century. Antoinè de Jussieu employed it in 1730 and compared it with simaruba. It is said to be an excellent astringent, useful in dysentery, diarrhœa, vomiting of cholera and all inflammations of the digestive tract. It is used in hemorrhages, angina, as a lithontriptic, and as an antipyretic. Externally it is employed for hæmorrhoids, itch, ulcers, etc., and has given good results in epizooty. The thick red fixed oil extracted from the seeds is considered an anthelmintic.

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[1] Herr Warnecke obtained on analysis of *Wrightine* figures corresponding to the formula $C_{11}H_{13}N$, and it is interesting as one of the few solid, non-oxygenated alkaloids occurring in nature. G. M. B.

FRUITS WITH A FLESHY PERICARP.

These are classified as Toxics and as Comestibles.

A. TOXICS—THE SEEDS OF THEVETIA NERIIFOLIA. The *Thevetia neriifolia* Juss. (*Ahouai neriifolia* Plum., *Nerio affinis angustifolia* Pluk., *Cerbera foliis linearibus* Plum., *C. Thevetia* L., *C. peruviana* Pers.), is indigenous to the West Indies, but has been introduced into India and the warmer parts of Asia, where it is frequently cultivated as an ornamental garden shrub and is employed here as in the country of its origin. In America the common names employed are: Ahouai, Yoire, Alelia de Matto, Jaca, Serpents nut, etc. in India: China Korobee, Kolkaphul, Exile or Yellow Oleander. It is an elegant small tree, with hard, white wood, with very fine grain; the leaves are linear, close together, alternate, nearly sessile, entire, shining, with a prominent mid-vein, very straight for their length (12 c.m. by 1 c.m.); the flower is large, yellow, fragrant; the bud resembles that of the Nerium.

The fruit is very characteristic, it is trigonal, 3½ c.m. by 4, and about 2½ c.m. thick, with the angles and borders blunt. At one of the angles is inserted the long peduncle and about this the five calycinal pieces; a circular line extends around the circumference of the fruit, and upon the broad upper margin is a small papilla. The fruit is at first green, then becomes black, shining; at maturity the surface is somewhat folded, the consistence is quite soft, the brownish pulp adhering to the stone. The endocarp is extremely hard, ligneous, yellow to brown in color. The kernel is very oily, bitter, and produces in a few moments a slight sensation of numbness on the tongue.

The active principle is *Thevetine*, isolated by DeVrij and studied by Blas and by Warden. It is a glucoside, crystallizable, splitting up by diluted acids into glucose and *Theveretine*, and which the experiments of Dumoutier show to be a tetanic; it is extremely bitter, possesses a metallic taste followed by a tingling of the tongue.

Warden has obtained from the mother-liquor, after the preparation of Thevetine, a yellow, amorphous, bitter substance, soluble in water, which appears much more active than Thevetine, and explains the extreme toxicity of the kernels.

Warden has discovered in the seeds and in the bark also a material, *pseudo-indican*, which was isolated as a yellow amorphous sub-

stance, probably a glucoside, and which yields with hydrochloric acid a blue coloration.

The seed of *Thevetia neriifolia* is a powerful poison, ordinarily considered an acrid narcotic, producing violent convulsions and gastro-intestinal phenomena. It has been employed as a purgative in rheumatism and dropsical conditions in the dose of one-half kernel. It is especially as a febrifuge that it is used along with the bark. In certain regions of America the seeds are considered a good alexiteric; two of the seeds pulverized are macerated in rum, the liquid drunk in fractions and the expressed pulp applied to the wound.

The Fruit and Seeds of Ahouai.—The *Thevetia Ahouai* A.DC. (*Cerbera Ahouai* L.), is a native of Brazil, and is distinguished from the *Thevetia neriifolia* by having relatively broad leaves. The seed are identical with the preceding and possess the same properties and usages.

The Seeds of Yccotli.—The *Thevetia Yccoth* A.DC. (*Cerbera thevetioides* Kunth), of Mexico, is one of the most poisonous of the Apocynaceæ. The *T. ovata* A.DC., *T. cuneifolia* A.DC., var. *Andrieuxii* and *T. glabra*, all these species and varieties are known in the state of Jalisco as Narcisos amarillos.

The tree is named Yccotli, Icotli, Yccali, Joyottli, or Joyote. The Aztec word is Joyottli, which Hernandez transformed into Yccotli, adopted by DeCandolle as the specific name. The fruit is a drupe, with two papillæ on the sides, rich in latex in the whitish mesocarp and contains a stone, a bony endocarp, yellowish, with four seeds or more often, two by abortion.

Herrera has separated from the seeds a non-drying fixed oil, by expression; another oil by ether and a white glucoside, crystallized, inodorous, non-volatile, very acrid, *Thevetosine*. Carpio has shown that the two oils are toxic in action upon pigeons, but not upon rabbits, and that the *Thevetosine* is extremely poisonous, emetic by action on the nerves, paralyzing the respiratory muscles first and then the other muscles and causing death by slow asphyxia. The substance has likewise some of the properties of the Digitalins.

The Mexicans use the seeds principally against hæmorrhoids, cutaneous maladies, ulcers and tumors. It seems likewise to be used to cure the bite of the rattlesnake.

THE SEEDS OF THE TANGHIN.—The celebrated ordeal poison of Madagascar, the *Tanghin* is furnished by the *Tanghinia venenifera* Poir. (*Cerbera Tanghin*, Hook. *Cerbera venenifera* Stend., *Tanghinin veneniflua* Boj., *T. madagascariensis* Dup.—Th.). The tree inhabits Madagascar, especially the forests of the north and the eastern sides of the island. It is cultivated in the hot-houses of Europe, but has not fructified. It attains a height of ten metres. A bluish-white latex, very poisonous, abounds in all parts of the tree. The fruit and seeds are the only parts employed. The leaves are remarkable for their elongated shape, lengthily acuminate, their soft consistence and the black color which they assume in alcohol or by drying.

The fruit is a drupe, in the fresh state yellow or reddish, shaped like an egg or a peach, and in which the external region is a fleshy sarcocarp, fibrous and includes a ligneous, stony endocarp, which contains a single kernel. The shell resembles in form and appearance of the surface that of an almond.

The structure of the seed is analogous to that of *Thevetia*.

The toxicity of the kernel of the *Tanghin* is such that a single seed suffices to cause the death of a number of persons, according to some, as many as twenty. This kernel is frequently employed in its native country for the poisoning of criminals and the heads of the arrows are likewise frequently coated with the poison. But the reputation of Tanghin comes especially from its use as a legal poison in the ordeals or judicial trials.

The first physiological experiments were by Ollivier, who ranks the poison with the acrid narcotics. Then Pelikan and Kölliker, who employed the leaves and dry branches, concluded that there was a muscular action, and at the same time, or even before, a nervous action. J. Chatin, in 1873, admits, as a result of his experiments with the kernels, that it destroys the muscular irritability without reaching directly the nervous system. It is a paralyzer of the heart, acting equally by way of the stomach, or subcutaneously; more quickly by the latter way. The effects are obtained on the invertebrate animals likewise.

[*To be Continued.*]

EDITORIAL.

F. A. FLÜCKIGER.

The pharmaceutical profession, in both continents, has met with an irreparable loss in the death of Professor Flückiger.

Such a thoroughly disciplined and well-stored mind is rarely found in any individual, and when, as in his case, that rich treasury of facts was about to be recorded for the enlightenment of all mankind, the loss is especially to be deplored.

We have been fortunate in securing a sketch of his life for the JOURNAL, from the pen of his friend Dr. Hoffmann, yet we cannot refrain from here calling attention to the peculiar style of Flückiger's writing, as illustrated in the Pharmacographia. A master of several languages, with the facts stored where he could use them, and with a clear and concise style, he was able to write so as to impress the dullest reader with a force that was fascinating. It is fittingly said by Dr. Hoffmann that some of his writings "may well be ranked among the few classic productions of modern pharmaceutical literature."

THE CULTIVATION OF LICORICE ROOT.

This is a subject which has often been talked and written about, but the industry has never taken that practical turn which is necessary in all such enterprises.

We give on another page an account of the whole subject as seen and understood by a practical man, who has for some years made this subject a special study.

With the immense tracts of undeveloped land in the United States at our disposal, there is no apparent reason why the whole amount of licorice root used in this country should not be grown here.

We hope to be able to give further information concerning the progress of this industry at an early date, as we understand steps have been taken towards its development.

NEW YORK COLLEGE OF PHARMACY.

A magnificent new building has been erected by the New York College of Pharmacy, and was occupied at the first of the present term. The formal opening, with appropriate exercises, took place Friday evening, December 28, 1894.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

LABORATORY EXERCISES IN BOTANY. By Edson S. Bastin, A.M., Professor of Materia Medica and Botany, and Director of the Microscopical Laboratory in the Philadelphia College of Pharmacy. Philadelphia: W. B. Saunders, 1895. Pp. 540.

This work is divided into two nearly equal parts: Part I, Organography; and Part II, Vegetable Histology.

The first exercise, under Part I, takes up roots, and the student is told how to practically examine a specimen of dandelion root. A full-page plate illustration accompanies the text. The external characteristics are first considered, and then the internal structure. Drawings are directed to be made of the root

as a whole, and of the inner structure. A pocket magnifying glass, or better, a simple dissecting microscope, is all the apparatus recommended at this stage of the work.

Stems and various other parts of plants are then systematically treated, the study of seeds completing this part of the book.

The exercises in Part II are prefaced by an illustrated description of the compound microscope and accessory apparatus, together with a statement of the preparation and properties of the more important micro-reagents. Staining fluids, permanent mounting or enclosing media, processes of mounting, drawing microscopic objects and general directions for work, also form important parts of the introduction. The first exercise in Part II takes the study of a typical vegetable cell, and the onion is selected as the most available material. The study of leaf structure occupies the closing exercises.

The author says in his preface that this book had its birth in the laboratory, and every page bears evidence that this concise statement is literally true.

Being an earnest advocate of practical study, and being one who carries his theories into practice by spending his time in the laboratory or in the field, Professor Bastin has mapped out a course which none but the hopelessly stupid can fail to follow. There is no work like it in the pharmaceutical or botanical literature of this country, and we predict for it a wide circulation outside of the author's own classes.

The illustrations of plant structures were all drawn by the author from natural objects, and are especially noteworthy. The mechanical part of the book has been very carefully attended to.

THE PHYSIOLOGY OF THE CARBOHYDRATES: THEIR APPLICATION AS FOOD AND RELATION TO DIABETES. By F. W. Pavy, M.D., LL.D., F.R.S. London: J. and A. Churchill, 1894. Pp. 280.

The author has long been recognized as an authority on this subject, and he very properly remarks in the preface that "a life's labor, attended with unceasing laboratory work, has been devoted to the attainment of the knowledge that has been acquired." The book, therefore, is not a compilation; it represents a mass of facts laboriously acquired. The titles of some of the chapters will indicate the ground covered; for example, there is a chapter devoted to each of the following subjects: *Transmutation of Carbohydrates, Glucosides, Description of Analytical Steps of Procedure, Ingested Carbohydrates Traced to the Portal Blood, The Liver in Relation to the Sugar Derived from Ingested Carbohydrates, The Liver in Relation to Constituent Sugar, The Blood in Relation to Sugar, The Urine in Relation to Sugar.* A number of other equally important chapters, followed by one on the *Author's Conclusions*, completes the work.

The conclusions reached are: That the old glycogenic theory must be abandoned; the liver, instead of forming sugar, prevents its entry into the general circulation, and thus secures escape from diabetes; carbohydrate matter, through the influence of living protoplasm, undergoes (1) transmutation, (2) application to the production of proteid, (3) transformation into fat.

It will thus be seen that the subject is a far-reaching one, and embraces the whole subject of health and disease.

The book deserves the closest study at the hands of the physician as well as

the chemist. There is not a dull page in it. The author is either describing an interesting series of experiments, or else he is drawing conclusions which he almost compels one to accept by his forcible and logical description.

A MANUAL OF ORGANIC MATERIA MEDICA AND PHARMACOGNOSY. By Lucius E. Sayre, Dean of the School of Pharmacy, Professor of Materia Medica and Pharmacy in the University of Kansas. Philadelphia: P. Blakiston, Son & Co. 1895. Pp. 555.

Professor Sayre issued a work in 1879, entitled "Organic Materia Medica and Pharmacal Botany," which has been out of print a number of years. The present volume is in a slight degree a revision of that work.

Part I, of about 85 pages, treats of Pharmacal Botany, and Part II, comprising 385 pages, is devoted to Organic Materia Medica and Pharmacognosy. In this part the author adopts two systems of classification:

(1) Arrangement of drugs according to their most prominent physical characteristics.

(2) Arrangement according to botanical relationship.

The former is quite brief, but by a system of numbers, a drug in this class can readily be found in the second class, where it is fully described.

In the second class each drug is treated systematically as follows: Botanical Characteristics, Habitat, Description, Constituents, Action and Uses, Official Preparations. There are 543 well-executed illustrations distributed through the work, and they add very materially to its value.

Appendix A. Insects Injurious to Drugs. Under this title, eight pages of illustrated matter are given, which cannot but be of value.

Appendix B. Organic Remedies Formed by Synthesis. Over forty pages are devoted to brief descriptions of what might be termed the newer materia medica.

Appendix C, treats of Pharmacal Microscopy. A glossary and full index complete the work.

The book is modern in every sense. It is modern in the order of treatment and in the facts detailed. The student will find it an indispensable companion, and the pharmacist and physician can turn to it as an excellent work of reference.

The publishers have done credit to themselves on the mechanical part of the work.

THE PRINCIPLES AND PRACTICE OF AGRICULTURAL ANALYSIS. VOLUME I, SOILS. By Harvey W. Wiley. Easton, Pa.: Chemical Publishing Company. 1894.

This work is coming out in parts, and was noticed soon after the appearance of the first number. Now, that the first volume has been completed, a brief review of the same may be of interest.

The author has in this volume succeeded in clearly giving the principles which underlie the science and art of the analysis of soils and the best approved methods of conducting it.

An introduction gives a brief description of soils and their origin. Then sampling, physical properties, and mechanical analysis are briefly described. Chemical analysis of soils is then taken up in detail, in which the most modern

methods of estimating nitrogen, phosphoric acid and a number of other constituents are concisely stated.

Appropriate illustrations accompany the text and aid the explanations.

It is a creditable work, and the first one of any magnitude on this subject that has been attempted in America. We predict for it a wide circulation. It is the intention of author and publishers to issue Volume II in monthly parts of 48 pages each, and complete it during the present year.

DICTIONNAIRE D'ANALYSE DES SUBSTANCES ORGANIQUES INDUSTRIELLES ET COMMERCIALES, par Adolphe Renard. Paris: Baudry et Cie. 1895. 8vo. Pp. 438.

This little work, arranged alphabetically, seems to cover a tolerably wide range of subjects, as it deals with the outlines of analysis of most of the technically important organic products.

Many of these are of pharmaceutical interest, as the essential oils, glycerin and fatty oils, alkaloids, sugars, soaps, tannins, resins, inks, wines and coloring matters, both natural and artificial.

Indeed, it covers very much the same ground as "Allen's Commercial Analysis," but in a much more condensed form. We notice that reference is made to the original journal literature in many cases, so that fuller details may be looked up if needed.

The illustrations are few and rather indifferent in their execution. The book, however, can serve an excellent purpose in readily indicating the most convenient methods of analysis and pointing out fuller information on most of the subjects. It seems to be thoroughly modern in its statements and references, and, from a casual examination, to be trustworthy.

S. P. S.

KOLA. An Illustrated Monograph on Kola, issued by the Scientific Department of Frederick Stearns & Co., Detroit, Mich.

This pamphlet of seventy-eight pages places in a compact and readable form a considerable portion of the existing information regarding a product whose medicinal action and economic value are claiming attention. It is another example of the enterprise of American manufacturers, and will, no doubt, tend to popularize and disseminate much useful information concerning this drug.

In scientific writings, the title, "Monograph," should be restricted to contributions which exhaustively *elaborate* and *extend* the existing knowledge on special subjects, and is here inappropriately used for a collection of four essays.

Part I, devoted to Kola pharmacognosy, is disappointing, as it contains scarcely any suggestions of original work by the writer, being largely a compilation from the excellent monograph of MM. Heckel and Schlagdenhauffen. Abstracts from this exhaustive contribution appeared ten years ago in the *Pharmaceutical Journal and Transactions* and in Christy's *New Commercial Plants and Drugs*, and the wording of a considerable portion of the pamphlet before us shows that this English translation has been extensively borrowed by the present compilers. To the chemistry and botany nothing of importance is added to our knowledge of ten years ago.

The probable economic value of Kola as a source of chocolate has not

received attention. Nor has the practical pharmacy, the best method of preparing and exhibiting the remedy, been treated.

Part II.—The physiological and therapeutic action is likewise a compilation from standard works on therapeutics and pharmacology, and not a single original experiment is described. The physiological action of Kola is undoubtedly due to the *caffeine* and the *tannin* contained therein. It is attempted here to assign undue importance to the physiological action of the slight amounts of theo-bromine and the glucoside, *kolanin*, present in the Kola-red of Heckel.

Part III.—A clinical study of Kola is a reprint of an able article by Dr. John V. Shoemaker, citing a number of cases in which Kola had been exhibited with benefit.

The closing part, a chronological index of the literature relating to Kola, is, perhaps, to the student of pharmacognosy, the most valuable.

G. M. B.

ORGANIC CHEMISTRY, Part I. By W. H. Perkin, Jr., and F. Stanly Kipping. Philadelphia: J. B. Lippincott Company. 1895. Pp. 302.

This work is designed for advanced classes as an introduction to organic chemistry.

Part I constitutes the whole of the present volume, and "deals with the fatty compounds." It contains a general account of the methods most frequently employed in the separation, purification and analysis of organic compounds, and in the determination of molecular weight.

The preparation and properties of typical compounds are then described, attention being directed to those changes which come under the heading of general reactions rather than to isolated facts regarding particular substances. By this means practical exercises accompany theoretical considerations.

Considering the size of the volume, a vast amount of valuable information is condensed into it, and it can be recommended to those taking an advanced course in organic chemistry, as well as to teachers as a work of reference.

DIE CHEMIE DER KOHLENHYDRATE UND IHRE BEDEUNTUNG FÜR DIE PHYSIOLOGIE. Rede, gehalten zur Feier des Stiftungstages der militärärztlichen Bildungs-Anstalten, am 2. August, 1894. Von Professor Dr. Emil Fischer. Berlin, 1894. Verlag von August Hirschwald.

This address of thirty-six pages deals with the history of the carbohydrates during its greater part, and then discusses the theories of the present day.

FORMULAIRE DES MÉDICAMENTS NOUVEAUX ET DES MÉDICATIONS NOUVELLES POUR 1895. Par H. Bocquillon-Limousin. The sixth edition of this work contains the following additions, chiefly in the line of synthetic remedies: *Alangine, Alæ pictum, Alphol, Antipyonine, Bromethylformine, Acide cathartinic, Chlorate de soude, Cristalline, Diaphtol, Di-iodoforme, Ferratine, Gaiacol-iodoforme, Gallate de mercure, Glycerophosphates, Glycozone, Iodoformine, Iodure de Rubidium, Lorétine, Lycétol, Manacine, Naphtol di-iodide, Nectandra amara, Neurodine Paico, Paraforme, Résol, Salicétol, Salumine, Sérothérapie, Suc pulmonaire, Sulphocaféate de soude, Tannal, Thermodine, Thioforme, Vasogène.* Some of these are not new to the American pharmacist, for instance, sodium chlorate. It, however, has recently attracted some attention in France as a remedy in cancer of the stomach; it is stated to be less toxic

than potassium chlorate. The book, however, is especially valuable for reference.

KOLA NUT, a working bulletin reprinted from the *Pharmacology of the Newer Materia Medica*. By Parke, Davis & Co.

It is of interest to observe the recent revival in the use of this product; for, though first mentioned in this country in 1865, in the AMERICAN JOURNAL OF PHARMACY, and later in medical journals, it failed to excite any special interest.

We hope that kola will receive the investigation its merits seem to demand. At present it is largely on trial as a therapeutical agent, and any extravagant claims made in its behalf by interested manufacturers should be taken *cum grano salis*. J. W. E.

ERDMANN-KÖNIG'S GRUNDRISS DER ALLGEMEINEN WAARENKUNDE, UNTER BERÜCKSICHTIGUNG DER TECHNOLOGIE. 12te Auflage, von Prof. Edward Hanausek. Leipzig, 1895. Large 8vo. Pp. 570.

This is a new and revised edition by Prof. Hanausek, of the Vienna School of Commerce, of the well-known work founded by Otto Linné Erdmann. It has long been a standard work, for commercial and technical schools, on the raw materials of commerce and the manufacturing arts. The ground covered is necessarily very extensive, embracing both inorganic and organic materials, and including the substances used in a wide range of the arts. Nevertheless, most valuable information is given, the microscopic structure of fibres, cereals and fruits being given, as well as the methods of preparing the raw materials for their technical applications.

The illustrations are numerous and in general of excellent quality, especially the many microscopical sections of plant and animal tissues. While the book is much more general in its character than "Berg's Pharmaceutische Waarenkunde," as now edited by Dr. Garcke, it possesses much of interest for the well-informed pharmacist or chemist.

The extensive bibliography of special and general works on the subjects covered in the work is also a valuable feature, as it points out to the student the sources of additional and more detailed information on many points.

S. P. S.

ZUR KENNTNISS IN DER ECHTEN COTORINDE ENTHALTENEN KRYSTALLISIRBAREN STOFFE. Von O. Hesse. Reprint from *Liebig's Annalen*, 282, 191. Revised by the author.

BERICHT ÜBER DIE DREIZEHNTE VERSAMMLUNG DER FREIEN VEREINIGUNG BAYERISCHER VERTRETER "DER ANGEWANDTEN CHEMIE" in Aschaffenburg am 5. und 6. August 1894. Munich, 1894.

THE CHEMISTS' AND DRUGGISTS' DIARY FOR 1895. Received from the *Chemist and Druggist* of London.

In addition to containing space in which to write memoranda, or the events of each day in the year, this volume contains much compact valuable information about such subjects as Laws Affecting Chemists and Druggists, Postal and Telegraphic Information, the Sale of Spirits and Wines, Water Analysis, etc. It is likewise a marvel in the line of advertising, as it shows what one can do in that direction in the great city of London.

PROCEEDINGS OF THE ELEVENTH ANNUAL CONVENTION OF THE ASSOCIATION OF OFFICIAL AGRICULTURAL CHEMISTS. Edited by Harvey W. Wiley. U. S. Department of Agriculture, Division of Chemistry, Washington, 1894.

The most interesting report in this number to pharmacists, is that on Tannin by Mr. W. H. Krug, in which an attempt is made to present a method that will be uniformly adopted by all chemists in this country.

A COMPILATION OF THE PHARMACY AND DRUG LAWS OF THE SEVERAL STATES AND TERRITORIES. By A. J. Wedderburn. U. S. Department of Agriculture, Division of Chemistry, Washington, 1894.

This pamphlet of 152 pages is of especial interest to pharmacists, since in it will be found the answers to many questions that are constantly being asked about pharmacy laws. We learn in the Letter of Submittal that the following States and Territories are without laws regulating the practice of pharmacy: Idaho, Indiana, Montana, Nevada, Arizona and the Indian Territory. The Maryland law relates only to the city of Baltimore.

REPORT ON THE EXTENT AND CHARACTER OF FOOD AND DRUG ADULTERATION. By A. J. Wedderburn. U. S. Department of Agriculture, Division of Chemistry, Washington, 1894.

CONSULAR REPORTS. Volume 46, Nos. 171 and 172

The most interesting contribution in No. 171 to pharmacists is the one on Kola Nut, which was printed in the January number of this JOURNAL.

A CONTRIBUTION TO THE KNOWLEDGE OF BACTERIOLOGICAL CHEMISTRY. By W. T. Wenzell, M.D. Reprinted from the Journal of the American Medical Association, December 15, 1894. This interesting paper was read before the Section on Materia Medica and Pharmacy, at the Forty-fifth Annual Meeting of the American Medical Association, held at San Francisco, June 5–8, 1894.

THE MEDICAL, PHARMACEUTICAL AND DENTAL REGISTER-DIRECTORY AND INTELLIGENCER. With special Medical, Pharmaceutical and Dental Departments, containing detailed information of Colleges, Hospitals, Asylums, Medical Societies, etc., for Pennsylvania, New Jersey, Maryland, Delaware and the District of Columbia. Third edition. George Keil, Publisher and Editor. Philadelphia, 1895.

REPORT OF COMMITTEE OF PHILADELPHIA COLLEGE OF PHARMACY ON ALCOHOL LEGISLATION.

To the Philadelphia College of Pharmacy:

Your Committe on Alcohol Legislation, appointed at the Pharmaceutical meeting, held on October 16, 1894, would report that the subject has received careful consideration, and that they have endeavored to discharge the duty imposed upon them by the resolutions and instructions then adopted.

A circular letter, a copy of which is here appended,[1] was issued to the pharmacists, and in addition to the circulation by mail to those engaged in the busi-

[1] This was printed on page 601, Vol. 66, of this JOURNAL.

ness in Pennsylvania, New Jersey and Delaware, a much larger number have been reached through pharmaceutical journals that have generously reprinted the letter.

The replies received and the correspondence resulting therefrom, prove beyond any doubt that the retail pharmacists are, almost universally, in favor of the abolition of all tax on alcohol used in the arts or medicine. Correspondence with a number of officers of State Pharmaceutical Associations indicated that they are likewise, enthusiastically in favor of the same.

The information gleaned from these replies fully confirmed the statements made in the circular letter issued by the Committee, and we emphatically reaffirm:

That alcohol is indispensable to the manufacture of medicinal products and in many processes in the arts.

That in the medicinal preparations in which it enters, it becomes as much a medicine as the contained drugs or chemicals.

That the present tax of $1.10 per proof gallon is oppressive, and opposed to the best interests of both manufacturer and consumer.

That this tax requires the manufacturer to greatly increase the amount of capital invested, and on a large percentage of such increase no profit is derived.

That this tax is a barrier to the healthy development of pharmacy and to the advance of the manufacturing industries in which alcohol is necessarily used.

That it prevents the retail pharmacists from preparing a large number of the preparations which he dispenses, and the purity of which he should be able to vouch for, in order to conscientiously discharge his duties to the community.

That the enhancement in the value of medicines, caused by this excessive tax is really a hardship to many sick and poor. Your Committee cannot believe that any urgency of the treasury would warrant Congress in continuing this barbarity, nor that the sentiment of the country would uphold a tax on the medicines needed by the sick and infirm.

A concise review of the history of the alcohol tax may not be inappropriate. When the demands on the Treasury, in 1862, compelled the introduction of an Internal Revenue system of taxation, a tax of 20 cents per proof gallon was placed on distilled spirits. This was continued until 1864, when the need of greatly increased revenue, compelled the Government to change the tax on distilled spirits three times within that year; first to 60 cents per proof gallon and then to $1.50 and finally to $2.00. This was recognized, at the time, as an extreme measure necessitated by the war, and the increase in fraud following each increase in the tax was notorious. The price of alcohol in 1861, 46 cents per gallon, was by this means increased, until, in 1865, it was $4.96.

The manufacturers and pharmacists at that time fully realized that this was a burden borne only partly by the consumers, as with each advance in the cost of their products they were enabled to charge only a portion of that advance.

In 1868, in response to numerous petitions for relief from this burdensome tax, and in accordance with the recommendations of the commissioner of Revenue, "that a rate of 50 cents per proof gallon was ample," Congress fixed the rate at that figure.

In 1872 this was advanced to 70 cents, and in 1875 again changed to 90 cents, and despite the appeals of the manufacturers for relief from this unjust burden, the tariff act of 1894 now advances the tax to $1.10 per proof gallon. On every

gallon of 94 per cent alcohol the Government now collects $2.07 tax. In other words, *tax is six times* that of the intrinsic value of the article at the present time.

This committee would especially direct attention to the fact, that, with the exception of a few isolated articles, *this recent increase in the burden of taxation, amounting to 38 cents per gallon on alcohol, has been entirely borne by the retail pharmacists.* The manufacturers and wholesale dealers have advanced the price of most products from 4 to 8 cents per pint, yet the retailer has been unable to distribute this advance on his sales in small amount and obtains for his goods no more than he did prior to this change in tax.

Since 1862 manufacturers have claimed that it was a very unwise and unjust policy of the Government to single out a large, very respectable and honorable class of manufacturers, engaged in most instances, in preparing products necessary for the welfare and prosperity of the nation, to bear unusual and burdensome taxation.

Alcohol is to the druggist a raw material, and is as indispensable to the manufacturer of pharmaceutical and chemical products as iron is to the manufacturer of steel. Alcohol is, to this class of manufacturers, as essential as cotton, iron, silk and fuel are to other industries.

Steel is the basis for many manufactures, yet the Government would not think of taxing these manufacturers so much per ton on the iron consumed, because certain manufacturers make therefrom fire-arms, with which evil-disposed persons might commit assault, murder or suicide. Why, then, should such manufacturers as pharmacists and chemists, who use alcohol only in their legitimate operations, be subjected to this enormous tax on their materials? Are we not engaged in an honorable and necessary calling and as much deserving of encouragement by the Government as others? We certainly should not be discriminated against unfairly by tax-laws.

While admitting that the alcohol consumed as a beverage may be a legitimate article of taxation, this attempt to tax people into temperance, after a trial of more than thirty years, has proven to be a signal failure. While there may be moral reasons for retaining this tax on beverages, neither morality nor revenue necessity should compel this enlightened nation to assume a position, of which a writer says: "The nation is robbing the sick far greater than the drunkard."

Several acts, aiming to grant to manufacturers the relief from the alcohol tax, have, at different times, been proposed to Congress, but, until the enactment of the present customs law, failed of passage. Notable was the act offered in the Senate in 1888, which provided for the use, by manufacturers, of alcohol on which the tax *had not been paid.* This provision necessitated every manufacturer establishing a bonded warehouse on his plant, from which the alcohol could be drawn only under the supervision of a revenue inspector. All such alcohol could only be received under the regulations covering the withdrawal of spirits from one bonded warehouse to another. The expense attached to such a plan would prohibit any but the larger manufacturers from adopting it, and it is questionable if the manufacturers of America would submit to the mortification of conducting their operations under the surveillance of an official inspector. This proposed Act of 1888 appears still to be lingering in the minds of some of those who are discussing the subject at the present time.

Your committee are not ready to admit that by the increase of tax on alcohol

in 1894, Congress intended to place an additional burden of taxation on manufacturers who necessarily use that article in their operations. The very fact, that section 61 was incorporated in the same act is an admission and a positive proof that the legislative branch of the government recognized as a distinct matter of principle that alcohol for legitimate manufacturing purposes, should be exempt from all taxation. It is admitted that the evident intention of this act was to grant that relief which had so long been prayed for by druggists and other manufacturers. It behooves us to cling *tenaciously* to this legislative concession and not permit the Government to recede from its admitted inclination to correct a long standing injustice.

Section 61 of the Customs Law of 1894, reads as follows:

"Any manufacturer finding it necessary to use alcohol in the arts, or in any medicinal or other like compound, may use the same under regulations to be prescribed by the Secretary of the Treasury, and on satisfying the Collector of Internal Revenue for the district, wherein he resides or carries on business, that he has complied with such regulations and has used such alcohol therein, and exhibiting and delivering up the stamps which show that a tax has been paid thereon shall be entitled to receive from the Treasury of the United States a rebate or re-payment of the tax so paid."

A careful study of this act convinces us that, although in some respects somewhat indefinite, it is a more simple, much wiser and more equitable provision than any of the previously proposed acts.

As many of the newspapers and pharmaceutical journals have commented upon this act and placed constructions upon its wording which your committee deems unwarranted, we would offer a few comments on its provisions.

The introducing words "*any manufacturer*" show that it was not intended to limit the operating of this act to only the *larger* manufacturers. The use of alcohol in large quantities was not the requisite. The act was to be general; to include all manufacturers whose products were used in the arts or medicine.

The words "*medicinal compound*" indicate that the intent was to include all products used in medicine in which alcohol is necessarily a component part, and as such, really a medicine itself, and not only products in which the alcohol has by chemical process undergone change so as to entirely destroy its identity. This narrow construction would limit the use of tax-free alcohol to only a few manufacturers of chloroform, ether, etc. It is even doubtful, if such chemical products could, with the correct meaning of the phrase, be classed with "*medicinal compounds.*"

Your committee would submit, that whatever regulations are prescribed by the Secretary of the Treasury or enacted by Congress for carrying this law into effect, they should be in harmony with the evident intent of the law. They should be simple and general and not discriminate in favor of only a few manufacturers. In this respect, it has been generally assumed by the public press that those manufacturers who obtained the benefit of this act would be compelled to establish a bonded warehouse and be subjected to the accompanying expense and espionage, and they assume, erroneously, that manufacturers would be permitted to withdraw alcohol from bond *without payment of the tax.* It is rather surprising that a writer, usually so well informed, as the Washington correspondent of the Philadelphia *Public Ledger*, should as late as January 1, 1895, state that "the Tariff Act authorizes the *withdrawal of alcohol without*

payment of tax when intended for use in the arts." * * * "The Secretary of the Treasury is required before putting the law into operation to formulate regulations for the protection of the revenue against improper *withdrawals.*"

It must be remembered that this act *does not* contemplate the establishment of bonded warehouses, and that when such a plan was proposed by a wholesale druggist coupled with the offer that each manufacturer should bear the expense of government inspection, the Secretary of the Treasury stated at once that a statute positively forbade the government accepting any financial aid in the discharge of the treasury regulations.

Any regulation looking toward the establishment of bonded warehouses by manufacturers must be strenuously opposed by pharmacists, as they would be deprived of any benefit, and such a provision would monopolize all chemical and pharmaceutical manufacture to the few who could afford the expense. The act does *not provide* that alcohol should be taken out of bond and used without the payment of tax, but does provide that only alcohol on which the *tax has been paid* can be used, and that *after such alcohol has been used* and the cancelled stamps delivered up, shall the manufacturer be entitled to receive from the treasury of the United States a rebate of the tax paid. The alcohol *must be used and not intended for use*, as the Government will not accept the intent.

This is at once a wise provision and a most excellent safeguard against fraud on the Treasury. The Government collects all the tax, and only when the "collector of the district is satisfied" that the alcohol has been used for legitimate manufacture within the intent and spirit of the act, shall the user receive repayment of the tax.

It was apparent to your committee, from the first, that the great obstacle in the way of enforcing this law is the difficulty of framing regulations by the Treasury Department that would be satisfactory to the various interests concerned, and that would be effective in protecting the Government from fraud. To this problem we have given careful deliberation. After some progress had been made in the consideration of the various ideas presented as a basis for some suggestions as to how this might be accomplished, your committee learned that committees of the Philadelphia Drug Exchange, and of the National Wholesale Druggists' Association were similarly engaged.

It was suggested that the work of these several committees would be more effective if they could agree upon suggestions or a plan which would be acceptable and secure the support and concerted and harmonious action of the various interests represented by these three bodies. A conference of representatives of these committees was arranged, and it was seen that a united action was perfectly feasible.

In this conference and in the subsequent deliberations of the joint committees, your committee have assumed the position of representing the interests of the retail pharmacists, and have insisted that the suggestions framed must be such as would permit this numerous class sharing in the benefits of the act.

A copy of the suggestions as now agreed upon is submitted herewith for your consideration. Should they merit the approval of the three bodies represented, copies will be transmitted to the Secretary of the Treasury and mem-

bers of Congress with the request that they form a basis of regulations or further Congressional action to render the law operative.

GEORGE M. BERINGER,
Chairman.

ROBERT ENGLAND,
WILLIAM MCINTYRE,
RUSH P. MARSHALL,
JOSEPH W. ENGLAND,
Secretary.

SUGGESTIONS OFFERED BY THE COMMITTEE ON LEGISLATION OF THE NATIONAL WHOLESALE DRUGGISTS' ASSOCIATION: THE COMMITTEE ON LEGISLATION OF THE PHILADELPHIA DRUG EXCHANGE; AND THE COMMITTEE ON ALCOHOL LEGISLATION OF THE PHILADELPHIA COLLEGE OF PHARMACY, AS A BASIS FOR FRAMING A LAW, OR MAKING REGULATIONS TOWARDS DEFINING AND RENDERING OPERATIVE SECTION 61 OF THE CUSTOMS LAW OF 1894.

DEFINING "MANUFACTURER."

That the term "*manufacturer*" as used in Section 61 of the above-mentioned act, and in these suggestions, shall be construed as meaning and including all those who purchase alcohol in *original packages*, as hereinafter defined, for the purpose of manufacturing products used in the arts or medicine, and who do not use the alcohol in the preparation of compounds that can be classed as beverages.

DEFINING ALCOHOL FOR MANUFACTURING PURPOSES.

That no spirit of less strength than eighty (80) per cent. above proof, or ninety (90) per cent. by volume, shall be classed by the Internal Revenue Office as *Alcohol for Manufacturing Purposes* within the meaning of the act.

DEFINING ORIGINAL PACKAGES AND REGULATING THE STORAGE OF ALCOHOL.

All alcohol used in the arts or in the manufacture of medicinal compounds on which a claim for rebate of the tax is to be made, must be purchased in packages, as put up by registered distillers, of not less than one-half barrel, and containing not less than twenty (20) wine gallons each. Such packages shall be considered as "*original packages*" within the meaning of the act. All such alcohol must be stored by the manufacturer, immediately on receiving the same, in an apartment separate from that in which alcoholic liquids of any kind are offered for sale, and each package must be marked distictly "*For Manufacturing Purposes Only.*"

That every manufacturer desiring to secure the benefit of the act, shall file with the Collector of Internal Revenue for the district in which the said manufacturing industry is located, a notice of such intention, accompanied by a statement of the location of the factory or apartment, and the character of the products in which the alcohol is to be used. For the faithful observance of the conditions of the law he shall give bonds, to be renewed annually, to an amount proportionate to the quantity of alcohol likely to be used.

That an accurate account be kept of all alcohol purchased for manufacturing purposes, and of the class of products in which it was used.

At the time stamps are surrendered and a claim made for payment of the rebate of the tax on alcohol used for manufacturing purposes, there shall be presented by the claimant a sworn statement setting forth the class of articles in the manufacture of which such alcohol was used.

No such claim to be allowed until it is certified to as correct by the Internal Revenue officer deputized for this purpose.

To protect the Revenue against fraud by the manufacture of any compound that, under the guise of medicine, could be popularly sold as a beverage, the Commissioner of Internal Revenue shall refer a sample of the preparation to an expert connected with his office for analysis, should he doubt the character of the product on which the manufacturer claims the rebate of tax on alcohol. Upon the report of this expert the Commissioner shall base his decision as to whether the manufacturer is entitled to the rebate. From this decision an appeal can be taken as hereinafter provided for.

From the Commissioner's decision there shall be a right of appeal to a Board to be selected by the Secretary of the Treasury, from names submitted by the presidents of such associations as:

The American Pharmaceutical Association.
The American Medical Association.
The American Chemical Society.
The National Wholesale Druggists' Association.
The National Paint, Oil and Varnish Association.

Each president presenting the names of three persons, but not more than one to be selected from each Association. The Board here provided for shall meet at stated intervals in Washington, at the office of the Commissioner of Internal Revenue, to consider the appealed cases as above provided for. Protection to the Revenue against the danger of illicitly reclaiming alcohol, selling the alcohol represented as having been used for manufactures, or other evasions of the law, to be afforded by the methods now at the command of the Internal Revenue Office for the detection of frauds.

COMMITTEE ON LEGISLATION OF THE NATIONAL WHOLESALE DRUGGISTS' ASSOCIATION.

Edward H. Hance, Chairman, Philadelphia.
Horace M. Sharp, Philadelphia.
Horace Burrough, Baltimore.
B. F. Fairchild, New York City.
Albert Plaut, New York City.
Hugh H. Osgood, Norwich, Conn.
Arthur W. Claflin, Providence, R. I.
John A. Gilman, Boston.
Charles Cook, Portland, Me.
Wm. A. Robinson, Louisville, Ky.
Dr. R. V. Pierce, Buffalo, N. Y.
L. A. Lange, Chicago.
C. H. West, St. Louis.
Frank A. Faxon, Kansas City, Mo.
J. C. Fox, Atchison, Kan.
John B. Purcell, Richmond, Va.
Evan F. Lilly, Indianapolis, Ind.
P. P. Van Vleet, Memphis, Tenn.
Edw. H. Cutler, St. Paul, Minn.
A. R. Olney, Clinton, Ia.
Wm. P. Reddington, San Francisco.

COMMITTEE OF THE PHILADELPHIA DRUG EXCHANGE.

Edward H. Hance. H. N. Rittenhouse.
H. B. Rosengarten.

COMMITTEE ON ALCOHOL LEGISLATION OF THE PHILADELPHIA COLLEGE OF PHARMACY.

George M. Beringer. Rush P. Marshall.
William McIntyre. Joseph W. England.
Robert England.

MINUTES OF A SPECIAL MEETING OF THE PHILADELPHIA COLLEGE OF PHARMACY.

PHILADELPHIA, January 23, 1895.

A special meeting of the Philadelphia College of Pharmacy was held this day. On motion of Robert England, Prof. Jos. P. Remington was called to preside, and T. S. Wiegand was asked to act as Secretary.

The chairman stated that the object of the meeting was to consider the report of the Committee on Alcohol Legislation.

The report of the Committee on Alcohol Legislation was read by the chairman of the Committee, Mr. Geo. M. Beringer, and suggestions for a plan to carry out the provisions of the law relative thereto. (See Report and Suggestions on preceding pages).

The chairman stated that the subject was open for discussion.

Mr. Procter, asking for information, wanted to know what a druggist should do about selling alcohol for burning purposes.

Mr. Beringer replied that the law did not contemplate the sale of alcohol by druggists and others who should get it tax-free for manufacturing purposes. Other alcohol, on which tax had been paid, would have to be sold for household purposes.

Mr. Redsecker, in further explanation, thought that those who contemplate using it for burning, varnishes, etc., must purchase it in original packages if their uses warranted getting that amount. He thought the suggestions of the Committee a fair presentation of the case.

Prof. Remington said there could be no question about the desirability of the Philadelphia College of Pharmacy taking an active part in trying to procure tax-free alcohol for the pharmacist. But the great question was not one of excluding the retail druggist, but of preventing fraud. The loss of $20,000,000 revenue to the Government was not for us to consider. It was not the duty of the College to point out how the Government revenue is to be maintained.

Mr. Ross said that Government inspectors are required at the present time to detect fraud, and decide between a beverage and a medicine, and they could do the same if the present law were enforced.

Prof. Remington said he thought that the Committee had done very good work, and offered the most practical set of suggestions of any he had seen.

It was announced that these resolutions had been endorsed by the directors of the Drug Exchange, and since then approved by the Drug Exchange itself;

they also received the approval of the executive committee of the National Wholesale Druggists' Association.

It was the opinion of the meeting that the Committee had shown their ability and zeal by their report, and that the suggestions made by them were the most valuable of any yet submitted to the Secretary of the Treasury for the purpose of carrying out the law.

On motion it was resolved and adopted that the Philadelphia College of Pharmacy approve of the report and suggestions thereto appended.

That the report be printed in the AMERICAN JOURNAL OF PHARMACY and the ALUMNI REPORT, and that an abstract of the report be given to the daily papers.

There being no further business, an adjournment was ordered.

THOS. S. WIEGAND,
Secretary pro tem.

MINUTES OF THE PHARMACEUTICAL MEETING.

PHILADELPHIA, January 15, 1895.

Frank G. Ryan, Ph.G., was asked to preside.

The Registrar reported the donation of a volume of the Memoir and Science Papers of the late Daniel Hanbury, presented by Dr. E. R. Squibb on behalf of Mr. Hanbury's brother. It was accepted with thanks. A paper upon the *Cultivation of Licorice Root in the United States*, by H. N. Rittenhouse, Ph.G., was read by Professor Trimble. Almost all the licorice root of commerce is of wild growth; a five-acre field is the largest patch of cultivated root the writer had ever seen. Five-eighths of the entire supply is derived from Southern Russia.

Mr. Procter stated that his father, the late Professor Procter, had grown it at Mt. Holly, N. J.

Mr. F. W. Haussmann read some *Pharmaceutical Notes*, the first one being on the contamination of glycerin by iron. As most of the glycerin used in pharmacy is put up in tin containers of about 50 pounds each, it was thought this was the most common cause of the trouble. Mr. Beringer stated that large quantities of the glycerin now sold is of foreign make, and is brought to this country in large iron tanks, from which it is put up in the various containers.

This is one of the troubles found in preparing glycerite of tannin, elixirs and salicylates.

Variations in the appearance or taste of vinegar of squill have been noticed, by careful examination; these have been traced to the use of the red variety of squill, which gives a much darker preparation, very much more bitter than that made from the white squill.

Ultramarine in sugar has been frequently noticed by pharmacists; the objectionable odor which is so frequently noticed occurs particularly after the addition of both organic and inorganic acids. Mr. Beringer suggested that some of the contaminating sulphides are derived from the boneblack which contains both iron and calcium sulphides, which very naturally will be dissolved in the syrup and set free by the action of acids when added to such syrups.

Iodides of Tin was the subject of a paper by Mr. Chas. Bullock, and read by Mr. Beringer. It has been recommended for use in pulmonary affections, those

who have brought it forward have not stated whether the stannous or stannic iodide was the one found to be useful.

Mr. Joseph W. England exhibited a sample vial of antitoxin serum used in diphtheritic diseases. This differs from the Koch lymph method, as that inoculates with diseased virus, while this supplies an antagonistic principle which renders the patient immune to the diphtheria poison. The cost per vial is $2.50.

On motion the papers were referred to the Committee on Publications.

A discussion was held upon tax-free alcohol, and an outline of the course of action by the committee was given by Mr. Beringer. The great difficulty attendant upon the adoption of a plan to supply tax-free alcohol arises from the needs of the Government for money, and also the difficulty of ascertaining the cost and best methods of regulating its sale for medicinal uses without endangering the loss of revenue from that used for the purposes of beverages.

On motion, adjourned.

T. S. WIEGAND.

OBITUARY.

Richard Clement Geist, Ph.G., Class 1889, died on Wednesday, August 29, 1894, of typhoid fever, at his residence, Medford, N. J., aged 26 years.

He was born at Medford, N. J., November 28, 1867, and received his education in the public schools of his native place. He entered the employ of Henry P. Thorn, Ph.G., Medford, N. J., to learn the drug business, April 8, 1885, and remained with him up to the time of his death.

He attended the Philadelphia College of Pharmacy and graduated with the class of 1889. He was a careful and competent pharmacist and strictly honest in his deportment to both his employer and to the customers, and was greatly respected by the entire community. He also enjoyed the respect and confidence of the medical profession of his neighborhood.

He was married, August 23, 1893, to Miss Rebecca W. Woolman, of Crosswicks, N. J., who, with his parents and a large circle of friends, mourned his early death.

His funeral was largely attended, all the business places of Medford being closed during the services, which were held the following Monday, September 3, 1894.

He was a member of the Alumni Association. W. E. K.

Dr. Chas. P. Stout, Ph.G., Class of 1880, died at his late residence, No. 830 North Fifth Street, on Wednesday, August 22d, 1894, aged 36 years. He was born at Florence Heights, N. J., and received his early education at his native place.

He came to Philadelphia January 1, 1878, and entered the employ of Leidy Seiple, at the corner of Fourth and Poplar Streets, where he learned the drug business. He attended the Philadelphia College of Pharmacy and graduated in the class of 1880. Afterward he attended the University of Pennsylvania and graduated as a physician in 1884, and immediately located on Fifth Street near Poplar, where he continued in the practice of medicine up to the time of his death. He was a member of the Alumni Association. His remains were interred in Cedar Hill Cemetery, at Florence Heights, N. J., on Saturday, August 25, 1894. W. E. K.